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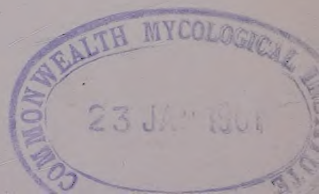
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## CONTENTS

	<i>Page</i>
Diseases caused by Bacteria and Fungi ... ..	1
Diseases caused by Protozoan Parasites ... ..	12
Diseases caused by Viruses and Rickettsia ... ..	17
Immunity ... ..	27
Parasites in Relation to Disease [General] ... ..	29
Parasites in Relation to Disease [Arthropods] ... ..	29
Parasites in Relation to Disease [Helminths] ... ..	31
Spontaneous and Transmissible Neoplasms and Leucaemias [Including Fowl Paralysis] ... ..	33
Nutritional and Metabolic Disorders ... ..	34
Diseases, General ... ..	38
Poisons and Poisoning ... ..	41
Pharmacology and General Therapeutics ... ..	44
Physiology, Anatomy and Biochemistry ... ..	45
Public Health, Veterinary Services and Veterinary Education ... ..	48
Reproduction and Reproductive Disorders ... ..	49
Zootechny ... ..	53
Technique and Apparatus ... ..	54
Book Reviews ... ..	54
Books Received ... ..	56

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# INDEX TO AUTHORS

- Acuthan, H. N., 170.  
 Adams, E. W., 68.  
 Ado, A. D., 106.  
 Allen, R. S., 204.  
 Alton, G. G., 44.  
 Alwar, V. S., 170.  
 Anczykowski, F., 86.  
 Andersen, E. K., 105.  
 Anderson, L. L., 294.  
 Anderson, W., 229.  
 De Angelis, R. C., 210.  
 Antipin, V. I., 31.  
 Aparecida Pontes, M., 210.  
 Araumi, W., 19.  
 Armstrong, J. A., 88.  
 Arscott, G. H., 250.  
 Ash, R. W., 271.  
 Ashcroft, M. T., 70, 71.  
 Austin, C. R., 288.  
 Averill, R. L. W., 287.
- Bailey, W. S., 63.  
 Baker, A. H., 235.  
 Baker, J. A., 148.  
 Ball, S. J., 83.  
 Barke, A., 181.  
 Barr, F. S., 61.  
 Bauer, F., 198.  
 Baumgärtner, G., 290.  
 Becker, W., 198.  
 Beer, J., 219.  
 Beeson, W. M., 200.  
 Bell, J. F., 102, 110.  
 Belokhvostov, S. D., 9, 10.  
 Bennett, L. R., 231.  
 Benson, B., 303.  
 Berger, H.-J., 281.  
 Berman, A., 256.  
 Berman, L., 150.  
 Bevis, R. E., 147.  
 Bhattacharya, P., 300.  
 Bianca, W., 257, 258, 259.  
 Bickley, W. E., 112.  
 Biester, H. E., page 50.  
 Bigley, W. S., 166.  
 Biozzi, G., 28.  
 Birch-Andersen, A., 105.  
 Bishop, M. W. H., 313.  
 Blaxter, K. L., 208.  
 Blom, E., 280.  
 Bobke, J. D., 238.  
 Bøvre, K., 32.  
 Bonadonna, T., 310.  
 Bond, H. W., 241.  
 Del Bono, G., 171.  
 Bowers, W., 263.  
 Bowman, G. W., 160.  
 Branton, C., 284.  
 Broomhead, C. L., 35.  
 Brown, F., 94.  
 Brown, J. M. M., 248.  
 Brownlee, A., 196.  
 Bürgisser, H., 230.  
 Bürki, F., 37, 46.  
 Burch, G. E., 225, 226.  
 Burdin, M. L., 119, 122.  
 Burns, E. C., 165.  
 Burns, J., 60.  
 Burns, W. C., 81.  
 Burton, L., 191.  
 Burton, L. K., 229.  
 Bussières, J., 188.  
 Butler, E. J., 207.  
 Byrne, R. J., 112.
- Cabasso, V. J., 134.  
 Cameron, H. S., 45.  
 Camici, D., 310.  
 Campbell, C. H., 100.  
 Capstick, P. B., 121, 122.  
 Carski, T. R., 104.  
 Caskey, F. H., 80.  
 Catron, D. V., 195, 204, 205.  
 Challey, J. R., 81.  
 Christensen, E. A., 190.  
 Christian, J. J., 136.  
 Clare, N. T., 246.  
 Clark, I., 263.  
 Clark, R. T. J., 67.  
 Clarkson, T. B., 309.  
 Clements, F. W., 213.  
 Cockle, W., 120, 122.  
 Cockrell, N. G., 163.  
 Cockrell, K. O., 68.  
 Cockrem, F., 261.  
 Coombs, R. R. A., 159.
- Cornelius, C. E., 215.  
 Costello, W. J., 254.  
 Crookall, J. O., 229.
- Dacres, W. G., 48.  
 Dale, C. N., 129.  
 Darrow, D. I., 168.  
 Daubney, R., 114.  
 Davis, L. R., 84, 160.  
 Davis, R. E., 92.  
 Dawson, F. L. M., 299.  
 Day, B. N., 294.  
 Dedashev, Y. P., 272.  
 Dehmel, H., 52.  
 Delrieu, A., 57.  
 Demidov, N. V., 187.  
 Desliens, L., 266.  
 Desliens, R., 266.  
 Diaz, F., 195.  
 Dijkstra, R. G., 22.  
 Dimić, J., 186.  
 Dissanaika, A. S., 176.  
 Dixon, F. J., 156.  
 Dollahite, J. W., 242.  
 Dollahan, J. C., 304.  
 Domański, E., 97.  
 Donker-Voet, J., 21.  
 Dow, C., 297.  
 Downs, W. G., Jr., 303.  
 Draganescu, N., 103.  
 Drozdov, G. G., 149.  
 Drummond, R. O., 162.  
 Dunn, H. O., 51.  
 Dutt, B., 206.  
 Dziuk, P. J., 279.
- Eadie, J. M., 194.  
 Eayrs, J. T., 273.  
 Eisenbud, M., 228.  
 Elberg, S. S., 40.  
 Embry, L. B., 201.  
 Emerick, R. J., 201.  
 Emmerson, M. A., 294.  
 Entrenas, S. M., 127.  
 Epstein, E., 214.  
 Erb, R. E., 292.  
 Ergüney, K., 144.  
 Ershov, V. S., 187.  
 Erwin, E. S., 157.  
 Estergreen, V. L., Jr., 282.  
 Euzéby, J., 188.  
 Evseev, V. A., 53.
- Fajer, A. B., 210.  
 Fankhauser, R., 230.  
 Ferrando, R., 322.  
 Ferrell, B., 74.  
 Ferris, R. D., 123.  
 Fife, E. H., Jr., 75.  
 Fine, J., 59.  
 Finney, G., 112.  
 Fitko, R., 97.  
 Fitzgerald, P. R., 80.  
 Fleischhauer, G., 27.  
 Forbes, M., 154.  
 Frank, E. R., page 50.  
 Frank, N. A., 6.  
 Frappe, D. L., 204, 205.  
 Fraser, A., 319.  
 Fried, R., 210.  
 Friedman, F., 191.  
 Fuchs, F., 131.  
 Fuhrer, B., 103.  
 Fulton, J. D., 88.
- Gaidamovich, S. Y., 108.  
 Gallagher, C. H., 240.  
 Garner, R. J., 227.  
 Garren, H. W., 34.  
 Gavrilov, V. I., 108.  
 Geoffroy, R. F., 263.  
 Giesbrecht, A. M., 210.  
 Gilbert, C., 214.  
 Gillespie, J. H., 117.  
 Gillman, J., 214.  
 Gilman, H. L., 39, 51.  
 Gird, E., 103.  
 Glazier, D. B., 217.  
 Gledhill, A. W., 137, 138.  
 Glenchur, H., 42.  
 Goble, F. C., 74.  
 Goldwasser, R. A., 104.  
 Goodwin, R. F. W., 133, 159.  
 Gorzelewska, K., 236.  
 Gourlay, R. N., 265.  
 De Gracia Mira, A., 127.
- Graham, O. H., 162.  
 Grau, H., page 56.  
 Graves, J. H., 94.  
 Green, W. W., 289.  
 Gregory, P. W., 305.  
 Grennberg, J., 241.  
 Greuel, E., 140.  
 Grishenkov, A. I., 18.  
 Groth, A. H., Jr., 63.  
 Groulade, P., 87.  
 Grunert, E., 296.  
 Gütte, J. O., 251.  
 Gutierrez, J., 92.
- Hadlow, W. J., 110.  
 Hall, J. G., 284.  
 Hall, W. H., 42.  
 Halpern, B. N., 28.  
 Hamburger, M., 2.  
 Hamilton, R., 303.  
 Hammarsten, J. F., 15.  
 Hammond, D. M., 80.  
 Hanfstring, J., 295.  
 Hansel, W., 291.  
 Hansen, M. F., 134.  
 Hashimoto, K., 14.  
 Haskins, M. D., 38.  
 Haslinger, R., 79.  
 Hays, V. W., 195, 204, 205.  
 Hazel, L. N., 294.  
 Hecke, F., 132.  
 Hein, R. E., 184.  
 Hennes, A. R., 15.  
 Henrickson, R. L., 254.  
 Henricson, B., 308.  
 Hentges, J. F., Jr., 304.  
 Herlich, H., 160, 173.  
 Hibler, C. P., 80.  
 Hill, C. H., 34.  
 Hinz, R. W., 107.  
 Hiramune, T., 49.  
 Hirsch, J. G., 155.  
 Hoare, C. A., 77.  
 Hobson, P. N., 194.  
 Hörter, R., 124.  
 Hogle, R., 251.  
 Hollister, C. J., 8.  
 Holtman, D. F., 60.  
 Homeyer, P. G., 195.  
 Hook, E. W., 113.  
 Hopkins, D. E., 164.  
 Hopkins, T. L., 168.  
 Hornbostel, H., 321.  
 Horton, R. E., 154.  
 Hosty, T. S., 104.  
 Howard, J. G., 28.  
 Howell, D. G., 38.  
 Huebner, R. A., 8.  
 Hughes, D. E., 51.  
 Hunter, G. L., 302.  
 Huygelen, C., 115.
- Ikegami, T., 135.  
 Inglis, J. M., 14.  
 Ionesco, N. I., 103.  
 Ishii, K., 1.  
 Ishii, S., 49.  
 Isildar, B., 64.  
 Ivashkevich, P. A., 9, 10.
- Jamieson, N. D., 276.  
 Jennings, A. R., 183.  
 Jensen, E. C., 255.  
 Jirka, M., 277.  
 Jiřina, K., 185.  
 Joachim, A., 33.  
 Johnson, A. E., 80.  
 Jones, L. D., 17.  
 Joysey, V. C., 159.  
 Julian, L. M., 305.  
 Juskiewicz, T., 236.
- Kaplan, H. S., 192.  
 Kaplanis, J. N., 164.  
 Karatai, S. S., 222.  
 Kassel, R., 191.  
 Kelly, W. R., 217.  
 Kendall, S. B., 174.  
 Kendrick, J. W., 117.  
 Khodzhaev, S., 43.  
 Kibler, H. H., 256.  
 Kiesel, G. K., 48.  
 Kilgimagi, U., 250.  
 Kingrey, B. W., 255.  
 Kingsbury, J. M., 244.  
 Kinsolving, R., 303.
- Kiser, K. H., 134.  
 Kissling, R. E., 104.  
 Kitchell, R. L., 306.  
 Kivel, R., 231.  
 Kjems, E., 190.  
 Klaus, H., 130.  
 Kieczkowski, A., 153.  
 Klein, H., 12.  
 Klingler, K., 230.  
 Koch, J. H., 240.  
 Kötsche, W., 98, 99.  
 Koger, M., 304.  
 komaritsyn, N. N., 90.  
 Konishi, S., 135.  
 Korn, G., 95.  
 Kotas, J., 277.  
 Koven, I., 59.  
 Kretzschmar, C., 13.  
 Krölling, O., page 56.  
 Kuborna, L. N., 141.  
 Kuhlman, D. E., 282.  
 Kutsky, R. J., 312.
- Lalitha, C. M., 170.  
 Lamina, J., 177.  
 Lamy, J., 78.  
 Lang, D. R., 291.  
 Leach, F. B., 218, 293.  
 Leon, M. A., 152.  
 Leonard, S. L., 209.  
 Leroy, G., 278.  
 Li, V. V., 314.  
 Liebenow, W., 129.  
 Lieberman, M., 192.  
 Linzell, J. L., 254.  
 Lobanov, V. N., 24.  
 Lofland, H. B., 309.  
 Long, D. A., 56.  
 Lovelock, J. E., 313.  
 Lozano, E. A., 17.  
 Lucas, J. M. S., 14.  
 Luckey, J. T., 180.  
 Lunkake, S. N., 300.  
 Lundholm, B. D., 72.  
 Luttrell, C. N., 113.  
 Lyles, D. I., 68.  
 Lyon, H. W., 136.
- McCance, R. A., 262.  
 McClure, H. G., 15.  
 McCraie, S. E., 165.  
 McDonald, I. R., 274.  
 McEntee, K., 51, 117.  
 McFarland, R. H., 184.  
 Macintyre, I. J., 207.  
 Mackenzie, C. P., 73.  
 Mackencher, D. G., 72.  
 Mackie, A. M., 275.  
 MacKinnon, M. M., 221.  
 MacNaughton, M. J., 197.  
 MacOwan, K. D. S., 118.  
 Madejski, Z., 236.  
 Magner, J. M., 183.  
 von Magnus, P., 105.  
 Mahoney, P., 231.  
 Malherbe, W. D., 249.  
 Mann, P. G., 35.  
 Mann, S. O., 194.  
 Mansour, A. M., 286.  
 Månsson, I., 26, 58.  
 Maracnac, N., 278.  
 Martin, C. R. A., 315.  
 Martin, J., 219.  
 Matthias, D., 130.  
 Mayes, O., 33.  
 Mayo, R. H., 200.  
 Melampy, R. M., 294.  
 Mellinkoff, S. M., 231.  
 Melby, J. C., 55.  
 Meloney, W. P., 163.  
 Mena, I., 231.  
 Meyer, K.-H., 232.  
 Meyer, M. E., 45.  
 Michna, S. W., 47.  
 Middendorf, F., 233.  
 Miller, C. W., 136.  
 Mitchell, K. J., 247.  
 Moberg, R., 301.  
 Möhlmann, H., 52.  
 Montplou, R.-J., 54.  
 Moody, D. W., 165.  
 Moran, A. B., 29.  
 Morrison, A. B., 211.  
 Morrison, R. A., 292.  
 Mortelmans, J., 115.  
 Moss, W., 196.



## Author Index

- Moulton, J. E., 125.  
Mouton, D., 28.  
Mucci, G., 298.  
Muchmore, H. G., 15.  
Muhler, J. C., 239.  
Murase, N., 19.  
Murphy, J. M., 5.  
Muschel, L. H., 75.  
Myers, B. A., 253.
- N**  
Najjar, V. A., 317.  
Nakahara, T., 19.  
Nayudu, P. K. V., 300.  
Nelson, A. B., 254.  
Nesheim, M. C., 209.  
Netsky, M. G., 309.  
Newberne, P. M., 212.  
Newton, N., 147.  
Nicholson, J. A., 217.  
Nicolau, C. S., 103.  
Nicolau, S. S., 103.  
Nilén, P.-O., 58.  
Nisbet, A. M., 275.  
Nisbet, D. I., 207.  
Norden, A., 152.
- O**  
Obel, A.-L., 223.  
Obiger, G., 7, 16.  
O'Brien, R. D., 167.  
Ochi, Y., 135.  
O'Dell, B. L., 212.  
Odell, G. V., 254.  
Olarte, J., 33.  
Ollerenshaw, C. B., 172.  
Olson, O. E., 201.  
Olsson, B., 30.  
Olsson, S.-E., 308.  
Overás, J., 169.  
Owens, K. G., 304.  
Oxford, A. E., 91.
- P**  
Page, R. H., 150.  
Palmer, A. C., 125.  
Parfitt, J. W., 174.  
Parker, W. D., 17.  
Peck, E. F., 218.  
Pellegrini, N., 171.  
Peoples, S. A., 215.  
Pereira Lima, F. S., 267.  
Perrin, D. D., 245.  
Petersen, K. B., 105.  
Peterson, H. O., 163.  
Phillips, P. H., 234, 237.  
Pine, L., 62.  
Plowright, W., 123.  
Plumlee, M. P., 200.  
Pollard, M., 145.
- P**  
Pope, G. S., 197.  
Pope, L. S., 254.  
Porterfield, J. S., 111.  
Pounden, W. D., 6.  
Prévot, A.-R., 54.  
Price, K. E., 65, 66.  
Prichard, R. W., 309.  
Prydie, J., 120, 122.  
Pullar, E. M., 202.
- R**  
Randhawa, M. S., 318.  
Rees, T. A., 25.  
Reich, M., 274.  
Renoux, G., 41.  
Reuber, H. W., 254.  
Reuss, U., 142.  
Ribeiro Netto, A., 267.  
Rigdon, R. H., 193.  
Rightsel, W. A., 150.  
Robbins, W. E., 168.  
Robertson, N. G., 247.  
Robinson, E. J., Jr., 175.  
Robson, S. S., 148.  
Rømer, O., 4.  
Rogge, W., 96.  
Romagosa Vila, J. A., 311.  
Ross, D. A., 253.  
Ross, E., 161.  
Roth, A. R., 166.  
Rottino, A., 191.  
Rowlands, W. T., 172.  
Rowson, L. E. A., 287.  
Rozhkov, G. I., 10.  
Rubaj, B., 128.  
Russell, R. S., 227.  
Rutenburg, A. M., 59.  
Ryu, E., 23.
- S**  
Sakatonov, S. V., 187.  
Sandbu, P., 32.  
Santos, J., 246.  
Sanger, V. L., 6.  
Santmyer, P. H., 183.  
Sarett, H. P., 211.  
Sastry, G. A., 189.  
Schang, L. C., 141.  
Schellner, H., 86.  
Schipper, I. A., 3.  
Schmidt, D., 139.  
Schneider, P. A., 230.  
Schoop, G., 144, 177.  
Schoor, R., 282.  
Schulz, L. C., 296.  
Schwarte, L. H., page 56.  
Schwartz, B., 182.  
Schweinburg, F., 59.  
Scott, M. L., 209.  
Seidel, E., 69.
- S**  
Seidel, G., 11.  
Sellers, K. C., 293.  
Sergeev, V. A., 93.  
Sergiev, P. G., 93.  
Sharman, G. A. M., 208.  
Sheldon, W. H., 89.  
Shelton, G. C., 183.  
Sherman, J. F., 241.  
Sherman, M., 161.  
Shewell, J., 56.  
Shimizu, T., 49.  
Shubladze, A. K., 108.  
Sibalić, S., 186.  
Siegmann, O., 82.  
Sievrt, A. H., 237.  
Siggel, H.-J., 252.  
Sillic, R., 54.  
Da Silva, A. C., 210.  
Singh, A., 220.  
Skinner, H. H., 101.  
Slepishkin, A. N., 109.  
Smith, H. R., 316.  
Smith, R. H., 269.  
Smith, V. R., 157.  
Smith, W. N., 84.  
Smythe, R. H., page 56.  
Snavey, J. G., 307.  
Snow, C. F., 320.  
Snyder, R. M., 113.  
Soltys, M. A., 76.  
Songer, J. R., 129.  
Sonnenblick, E., 59.  
Speer, V. C., 195, 204, 205.  
Spink, W. W., 55.  
Springer, G. F., 154.  
Starr, T. J., 145.  
Starzyk, J., 79.  
Staub, H., 143, 144.  
Stebbins, M. R., 134.  
Steel, K. J., 268.  
Stephen, L. E., 73.  
Stevens, J. W., 38.  
Stieglitz, A. R., 74.  
Stiffel, C., 28.  
Stone, E. J., 284.  
Stookey, G. K., 239.  
Storz, J., 72.  
Straub, O. C., 215, 251.  
Stromberg, M. W., 306.  
Stulberg, C. S., 150.  
Suttie, J., 234.  
Suzuki, K., 19.  
Syverton, J. T., 107.
- T**  
Tadić, M., 186.  
Täubrich, F., 285.  
Talmage, D. W., 158.  
Taneja, G. C., 260.
- T**  
Tan, Hok Seng, 50.  
Tavener, H. W., 289.  
Taylor, D. J., 241.  
Terhaar, C. J., 184.  
Terriere, L. C., 250.  
Thompson, J. M., 308.  
Titova, S. M., 106.  
van Tongeren, H. A. E., 115.  
Trager, W., 85.  
Train, G., 20.  
Treiber, G. H., 164.  
Truszczński, M., 95.  
Tulbaev, P., 270.  
Turk, J. L., 151.  
Turner, J. H., 178.  
Tyler, W. S., 305.
- U**  
Urban, K., 254.
- V**  
Vaida, M., 224.  
Valée, A., 57, 87.  
Vallee, B. L., 199.  
VanDemark, N. L., 282.  
Veckenstedt, A., 98.  
Velikovskaya, Y. A., 173.  
Veselova, T. P., 173.  
Vesselinovitch, S. D., 283.  
Vollbrechtshausen, R., 86.  
Voronin, Y. S., 9.
- W**  
Waclawek, D., 79.  
Walker, W. F., 2.  
Walsh, J. J., 225, 226.  
Walshe, T. O., 247.  
Wagner, W. C., 39, 51, 117.  
Wagner, R. R., 113.  
Warnick, A. C., 304.  
Watson, S. J., 62.  
Weber, T. B., 180.  
Weigle, W. O., 156.  
Weikl, A., 216.  
White, E. P., 246.  
Whitney, G. F. H., 235.  
Widdowson, E. M., 262.  
Wilkie, W. J., 203.  
Wilson, R. S., 208.  
Witcomb, M. A., 123.  
Withers, F. W., 218.  
Wolfe, L. S., 167.  
Worden, A. N., 235.
- Y**  
Yanagawa, R., 49.  
Yancey, F. S., 112.  
Yelf, J. D., 243.
- Z**  
Zinneman, H. H., 42.  
Zolli, Z., Jr., 65, 66.  
Zwart, P., 21.

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THE  
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Vol. 30]

January, 1960

[No. 1

## DISEASES CAUSED BY BACTERIA AND FUNGI

Ishii, K. (1959). **Studies on the serological typing of staphylococci isolated from bovine milk.** — Jap. J. vet. Sci. 21, 139-145. [In English. Summary in Japanese.] 1

Slide agglutination of 218 strains of coagulase-positive staphylococci isolated from milk was performed by the technique of Oeding [V.B. 24, 6]. In addition the antigenic structure of a few strains was examined by cross-absorptions of immune sera between type strains and the antisera produced from rabbits. Out of 169 strains 100 could be typed.—R.M.

Walker, W. F. & Hamburger, M. (1959). **A study of experimental staphylococcal endocarditis in dogs. I. Production of the disease, its natural history, and tissue bacteriology.** —J. Lab. clin. Med. 53, 931-941. [Authors' summary modified.] 2

Acute staphylococcal endocarditis was produced in dogs after operative perforation of the aortic valve and subsequent inoculation of a virulent strain of *Staphylococcus aureus*. Ventricular fibrillation occasionally caused trouble at the operating table, and sometimes postoperative infections and aortic rupture occurred. However, the operative technique is a satisfactory one, and the incidence of endocarditis after a single inoculation of approximately  $10^7$  staphylococcal cells was high. The course of acute staphylococcal endocarditis in dogs resembled that in man and was rapidly fatal within a few days to 2 weeks.

Histological study of the infected valves showed huge masses of staphylococci usually enmeshed in fibrin with varying degrees of polymorphonuclear reaction. Quantitative cultures of the valves yielded  $10^9$  to  $10^{11}$  staphylococci per g. of tissue, as contrasted with  $10^3$  to  $10^6$  or  $10^7$  in other tissues.

Schipper, I. A. (1959). **Mastitis prevention and therapy.** — Brit. vet. J. 115, 334-340. [Author's summary modified.] 3

Poor management is a common initial or predisposing cause of mastitis. The frequent removal of the secretions from an infected mammary gland is a valuable adjunct to chemotherapy. Two essentials in successful mastitis control are the dairyman's knowledge of good animal husbandry and his cognizance of the value of veterinary service.

Rømer, O. (1959). **Control of udder infections with Group B-, C-, G- and L-streptococci in dairy herds.**—Proc. XVth Int. Dairy Congr., London 1, 99-105. [Summaries in French and German. Author's summary modified.] 4

Comparative examinations regarding the diagnosis of Group B-, C-, G- and L-streptococci in can-milk samples collected in the dairy, and in quarter samples collected from individual cows in the corresponding herds were made. Previous statements that Group B-, C-, G- and L-infected herds could be indicated by examination of can-milk samples were confirmed.

Control of these infections in 4 dairy districts resulted in the elimination of infection in a considerable number of herds. It is confirmed that penicillin treatment of such infections is effective. It was found that the risk of new infections in non-infected herds is quite considerable, therefore herds should be submitted to a running control by examination of can samples. Concerning new infections, the risk of transmission of streptococci from other sources, e.g. man and pigs, should be considered.

A comparison of results from individual can samples and pooled samples showed that examination of pooled samples is not as reliable as examination of can samples for diagnosis of Group B-, C-, G- and L-infected herds.

Murphy, J. M. (1959). **The effect of certain mild stresses to the bovine teat canal on infec-**



**tion with *Streptococcus agalactiae*.**—Cornell Vet. 49, 411-421. [Author's summary modified.] 5

The teat canals of two teats of each of 10 young cows of proved resistance were subjected to mild stress in an attempt to alter their resistance to infection by *Str. agalactiae*. The stresses were: (1) passing a small cotton swab moistened with an oily solution of an oestrogen 6 mm. into the teat canal once a day for 5 consecutive days during the week immediately preceding the exposure week, (2) repeatedly subjecting the empty teats to 10 minutes of "milking" at an elevated machine vacuum of 17 inches following the normal milking at 13 inches, and (3) removing some of the soft keratin lining from the teat canal with soft plastic cannulas at three milkings immediately before exposure to the test organisms.

It was found that the first two stresses did not produce any gross change in the teat canals, no change was detectable histologically, and no change occurred in the resistance of the teat canals to *Str. agalactiae*. In the third stress, called reaming, the resistance of all the experimental teats was completely broken and infection with the test organism always occurred. After the infection was removed by penicillin treatment and sufficient time had elapsed for the keratin to be renewed, all such canals were again resistant.

Sanger, V. L., Frank, N. A. & Pounden, W. D. (1959). **Udder reactions to sterilized cultures and filtrates.**—Amer. J. vet. Res. 20, 718-722. [Authors' summary modified.] 6

Mastitis developed in 12 of 16 quarters (each having a previous history of mastitis) after infusion of killed broth cultures or cell suspensions of *Str. agalactiae*; 7 control quarters (with no history of mastitis) remained healthy.

Seven quarters with previous history of mastitis reacted when four different killed broth cultures were infused, and so did four similar quarters infused with sterilized milk cultures or filtrates of *Str. agalactiae*.

The reaction was similar to that of natural mastitis and consisted of oedema with fibrin and massive neutrophilic infiltration into the interstitial tissues, ducts, and alveoli. Only scattered plasma cells were found.

Obiger, G. (1959). Hat das Maschinenmelken mit hoher Pulszahl und hohem Vakuum Einfluss auf die Gesundheit des Euters? [The influence of high pulsation rate and high

vacuum milking machines on the health of the cow's udder.]—Proc. XVth Int. Dairy Congr., London 1, 304-307. [In German. Summaries in English and French. English summary modified.] 7

The author studied, with 8 cows, the effects on the udder and the quality of the milk of machine milking with high pulsation rate (110-120 pulsations/min.), and a vacuum of 45 cm. Hg. Healthy cows or cows infected with streptococci, which had been milked previously with slow rate milking-machines, did not show any udder defects, after the high pulse rate machine had been used for milking. One prolonged milking (up to 69 min.) had no harmful effects. Similarly, when two cows were milked for 6 months with machines at a high vacuum (45 cm. Hg), no harmful effects on the udder were observed.

Hollister, C. J., Huebner, R. A., Boucher, W. B. & DeMott, T. (1959). **Parenteral benzathine penicillin V in bovine mastitis.**—Amer. J. vet. Res. 20, 287-296. 8

Single and multiple intramuscular doses of benzathine penicillin V to 49 cows showing udder fibrosis or clinical mastitis indicated that the ensuing penicillactia results from active participation of the mammary gland rather than from a mere threshold mechanism of blood circulatory spill and, as has been shown by other investigators, penicillin injected i/m is effective in eradicating penicillin-susceptible organisms when the required concentrations, as determined by *in vitro* sensitivity tests, are reached in the mammary tissues.

—A. ACKROYD.

I. Ivashkevich, P. A., Belokhvostov, S. D. & Voronin, Y. S. (1959). [Action of disinfectants on spores of the STI vaccine strain of anthrax bacillus, studied by electron microscopy.]—J. Microbiol., Moscow 30, No. 6 pp. 74-78. [In Russian. Summary in English.] 9

II. Ivashkevich, P. A., Belokhvostov, S. D. & Rozhkov, G. I. (1959). [Morphology of anthrax spores of the STI vaccine strain in relation to sensitivity to disinfectants.]—Ibid. pp. 78-81. [In Russian. Summary in English.] 10

I. Formaldehyde alone acting for 20-30 min. did not change the morphology of anthrax spores as seen under the electron microscope, but a mixture of 17% aqueous soln. of formaldehyde and 10% (by weight) monochloramine disrupted the spores after 3-7 min.

II. Three morphological types of spore

were recognized by electron microscopy. One type, relatively large spores with a rough surface, was more resistant to a mixture of formaldehyde and monochloramine than the other types.—R.M.

Seidel, G. (1959). Ein Versuch zur Differenzierung von *B. cereus* oder *B. anthracis* innerhalb eines Labortages. [An attempt to differentiate *B. cereus* from *B. anthracis* within eight hours.]—Zbl. Bakt. I. (Orig.) 175, 433-436. [Summaries in English, French, Spanish and Russian. English summary modified.] 11

The author tried to achieve a differentiation of *Bacillus cereus* from *B. anthracis* within one day of laboratory work, using different tests. Individual tests did not give uniformly positive or negative results since *cereus* strains showed great variations, but a combination of six tests always allowed a valid differentiation.

Klein, H. (1959). Zur Tuberkulinisierung von Ziegen im Rahmen der Rindertuberkulose-tilgung. [Tuberculin testing of goats in conjunction with eradication of tuberculosis in cattle.]—Mh. VetMed. 14, 297-301. 12

The technique of the tuberculin test in goats is described. On farms containing tuberculous cattle 28.3% of the goats were positive, compared with 1.1% on farms with attested cattle. Goats kept with cattle herds should be included in tuberculin tests.

—M.G.G.

Kretschmar, C. (1959). Über den Wert der Hämagglutination nach Middlebrook und Dubos mit Milchserum zur Diagnose der Eutertuberkulose bei der Routineuntersuchung der Milch. [The Middlebrook-Dubos whey test in the diagnosis of tuberculosis of the udder.]—Arch. exp. VetMed. 13, 132-140. 13

Of 75 whey samples from cows with TB. of the udder, 60 were positive to the Middlebrook-Dubos test, 7 doubtful and 8 negative. Of 270 samples from cows with mammary disorders other than TB., 44 (16%) were positive and 20 doubtful. Of 239 samples of normal milk 16 (7%) were positive and 8 doubtful. Of 29 positive samples which were negative according to g.pig inoculation, 25 were from cattle positive to the tuberculin test. The c.f. test was positive for only 12 of 19 samples of tuberculous milk. The test is recommended for routine use.—M.G.G.

Lucas, J. M. S. & Inglis, J. M. (1959). Swelling of the infraorbital sinus in poultry caused by an infection with *Mycobacterium tuberculosis*.—Vet. Rec. 71, 531-532. [Authors' summary.] 14

Two cases of avian tuberculosis in which a unilateral swelling of the infraorbital sinus was an obvious symptom are described.

Hennes, A. R., Muchmore, H. G., McClure, H. G. & Hammarsten, J. F. (1959). In vitro inhibition of growth of *M. tuberculosis* by certain 11-oxygenated steroids.—Proc. Soc. exp. Biol., N.Y. 101, 145-147. [Authors' summary modified.] 15

Hydrocortisone and corticosterone in a concentration of 100 µg./ml. markedly inhibited growth of isoniazid-sensitive and -resistant strains of tubercle bacilli grown in a simple synthetic culture medium. Ten and 20 µg./ml. retarded growth slightly in some strains.

Obiger, G. (1959). Die Pyogenes-Mastitis des Rindes. [*Corynebact. pyogenes mastitis* in cattle.]—Tierärztl. Umsch. 14, 15-18. 16

A review of the problems of this insect-borne disease. There is no drug specific for the organism. Early treatment prevents death, but the affected quarter is usually lost. Prophylactic measures with aim of sealing the teats were unsuccessful, but promising results have been achieved by spraying the udder with contact insecticides [see V.B. 26, 1515].—M.G.G.

Lozano, E. A., Jones, L. D. & Parker, W. D. (1959). An erysipelas serum-culture agglutination (ESCA) test.—Amer. J. vet. Res. 20, 394-397. 17

Using a modification of the Wellmann precipitation test, specific circulating antibody to *Erysipelothrix rhusiopathiae* in pigs' sera could be correlated with resistance to challenge. Filtered inactivated serum was added to 2 tubes of tryptose broth in approx. 5% and 1% concentrations. These were inoculated with the XA2 strain of *E. rhusiopathiae* and incubated at 37°C. for 18 hours. Absence of agglutination in both tubes indicated susceptibility to swine erysipelas; agglutination in the 5% serum concentration, partial immunity; agglutination in both tubes, complete immunity. With horse serum, the test gave satisfactory results, but with sera of fowls, cows and sheep, non-specific agglutination occurred.

—A. ACKROYD



Grishenkov, A. I. (1959). [Distribution of isotope-labelled swine erysipelas bacteria.]—Proc. Lenin Acad. agric. Sci. 24, No. 5. pp. 13-16. [In Russian.] 18

The development of radioactivity in the blood and organs of pigeons inoculated i/m with *Erysipelothrix rhusiopathiae* labelled with  $P^{32}$  or  $I^{131}$  did not correspond with the results of cultural tests. It is concluded that bacteriological methods are more suitable for studying the distribution of bacteria in the body.

—M.G.G.

Murase, N., Suzuki, K., Nakahara, T., Araumi, W. & Hashimoto, K. (1959). Studies on the typing of *Erysipelothrix rhusiopathiae*. I. Serological behaviour of *Erysipelothrix rhusiopathiae* isolated from pigs. — Jap. J. vet. Sci. 21, 113-121. [In English. Summary in Japanese. Authors' summary modified.] 19

*Erysipelas bacilli* were isolated from the tonsils of 50 out of 129 apparently normal pigs. 40 strains were examined by the precipitation test: 3 strains belonged to Group A and 22 to Group B. The remaining 15 were classified into 3 serotypes temporarily designated Group C (3 strains), D (7 strains), and Fr (5 strains).

All the 22 strains from pigs with the septicaemic form of erysipelas were of Group A, while 16 of the 19 strains from pigs with the urticarial form were of Group B. No strain isolated from sick pigs belonged to Groups C, D and Fr.

Train, G. (1958/59). Über die Züchtung und das Verhalten der *Erysipelothrix rhusiopathiae* im bebrüteten Hühnerei. [Cultivation and behaviour of *Erysipelothrix rhusiopathiae* in incubated hens' eggs.]—Wiss. Z. Humboldt-Univ. 8, 239-267. [Summaries in English, French and Russian. English summary modified.] 20

*Erysipelas bacteria* of the Frankfurt G strain passaged in embryonated hen's eggs multiplied in all parts of the egg, and the embryo generally died after 2½ days.

In the course of 30 direct passages the erysipelas strain gradually lost its pathogenic effect on mice, fowls, and pigs. The power of immunization remained, and inoculation of fowls and pigs with egg-adapted cultures created vigorous immunity against artificial infection. Cultivation on unfertilized or dead eggs did not result in loss of pathogenic effect.

Zwart, P. & Donker-Voet, J. (1959). Listeriosis bij in gevangenschap gehouden dieren.

[*Listeria infection in captive animals.*]—Tijdschr. Diergeneesk. 84, 712-716. [In Dutch. Summaries in English, French and German. English summary modified.] 21

The following serological types of *Erysipelothrix monocytogenes* were isolated in the Netherlands, from 2 diamond doves (*Geopelia cuneata*) Type 4b; 1 marmoset (*Hapale jacchus*) Type 4c; 2 Swainson's lorikeets (*Trichoglossus novae-hollandiae*) Type 1a; 1 paca (*Coelogenys paca*) Type 4b; 2 chinchillas (*Eryomys chinchilla*) Type 1a; 3 canaries (*Serinus canarius*) Types 1a and 4b.

Dijkstra, R. G. (1959). Huidinfectie door *Listeria monocytogenes*. [Skin infection associated with listeria in man.]—Tijdschr. Diergeneesk. 84, 719. [In Dutch. English summary modified.] 22

A veterinary surgeon who assisted delivery of the foetus in an aborting cow developed a papular exanthema on both arms. From some of the papules, and from stomach and intestines of the aborting calf, *E. monocytogenes* Type I was isolated.

Ryu, E. (1959). Studies on *Pasteurella multocida*. I. Inhibitory action of blood on the growth of *Past. multocida*. II. The value of egg agar used for the cultivation of *Past. multocida*. — Jap. J. vet. Sci. 21, 97-102; 133-138. [In English. Summary in Japanese.] 23

I. Blood of various animals inhibits growth of *pasteurella*.

The degree of inhibition was higher in horses and cattle, lower in pigs and rabbits, and absent in chickens. The inhibitory substance in blood has nothing to do with agglutinin, and it was destroyed or reduced by heating at 60°C. for an hour, so it may be similar to complement. Blood or serum should be avoided as nutrients for the cultivation of *pasteurella* organisms.

II. A medium prepared from one part of whole homogenized egg and 15 parts of agar at pH 7.2-7.4 supported growth of 20 stock strains of *pasteurella*. It kept longer and was easier to prepare than blood-agar or serum-agar.—R.M.

Lobanov, V. N. (1959). [Pathology of experimental plague in camels.]—Ark. Pat. 21, No. 7 pp. 37-43. [In Russian. Summary in English.] 24

L. mentioned reports in Russian literature between 1911 and 1920 that human beings had contracted plague through eating meat from



infected camels. He inoculated 10 camels i/d and 1 s/c with between 1,000 million and 52,000 million organisms of *Past. pestis*. They were killed between 13 and 48 days after infection. Small rapidly-healing abscesses with scar formation appeared at the site of inoculation. Subcutaneous lymph nodes all over the body were affected with acute or subacute purulent and non-purulent lymphadenitis. The illness was febrile but mild and the animals recovered 2-3 weeks after infection. Changes in internal organs were observed in 6 camels and consisted of haemorrhages in serous membranes and dystrophy in parenchymatous organs. Two camels which received the highest dose of organisms were emaciated when slaughtered.

—R.M.

Rees, T. A. (1959). **Studies on *Escherichia coli* of animal origin. 3. *E. coli* serotypes from pigs.**—J. comp. Path. 69, 334-338. [Author's conclusions modified.] 25

259 strains of *E. coli* from diseased pigs were examined serologically. Three serotypes, 0138,K81(B), 1039,K82(B) and RVC2907, normally haemolytic, occurred in a high percentage of cases of gastro-enteritis and oedema disease. Four serotypes 0101,K?(A), 0103,K?(B), 0114,K?(B) and 0117,K?, usually associated with colibacillosis in calves, occurred in a small number of diseased pigs. A serotype 0119,B14, which has been isolated from cases of infantile gastro-enteritis, occurred in one of the pigs.

These records are discussed in the light of the distribution of *E. coli* serotypes in nature.

Mansson, I. (1959). **Septic enteritis caused by haemolytic coliform bacteria.**—Proc. XVIth Int. vet. Congr., Madrid 2, 529-530. 26

On numerous occasions large numbers of haemolytic *Escherichia coli* have been isolated from the liver, spleen, lymph nodes and intestinal tract of animals examined P.M. In 25, mostly pigs, the diagnosis was septic enteritis, acute gastro-enteritis or septic haemorrhagic enteritis. Using type sera prepared from 10 strains in rabbits, 45 strains (Group A) were found to have identical O and K antigens (O138, K81, H14) and seemed serologically unrelated to the other strains tested. Eight other strains (Group B) had O-antigen 141 and H-antigen 4. On one farm, Group A strains were recovered from dead pigs, calves and mature cattle, whilst on another, Group A strains identical with those

isolated from previous cases were recovered from the faeces of healthy young and adult pigs.—A. ACKROYD.

Fleischhauer, G. (1959). Über einen Toxin-nachweis bei Colibakterien mit Hilfe einer Präzipitinreaktion. II. Mitteilung. [Demonstration of toxin in *coli* bacilli with the agar gel diffusion test. II.]—Zbl. Bakt. I. (Orig.) 175, 388-394. [Summaries in English, French, Spanish and Russian. English summary modified.] 27

Precipitation lines can be demonstrated in agar gel diffusion tests when *Escherichia coli* strains and their homologous sera are used. Precipitation was chiefly produced by liberated endotoxin. Heating at 100°C. for 60 min. considerably diminished precipitation. *E. coli* cells killed by formaldehyde (1% for 4 hours) do not result in poorer precipitation lines.

Howard, J. G., Biozzi, G., Halpern, B. N., Stiffel, C. & Mouton, D. (1959). **The effect of *Mycobacterium tuberculosis* (BCG) infection on the resistance of mice to bacterial endotoxin and *Salmonella enteritidis* infection.**—Brit. J. exp. Path. 40, 281-290. [Authors' summary modified.] 28

Two weeks after infection with B.C.G. the rate of clearance of carbon from the blood stream by the reticuloendothelial system in mice was increased 5 times. Simultaneously, the animals were 100 times more susceptible to killing by bacterial endotoxin than normal. Radiophosphorus-labelled endotoxin was, like carbon, cleared more rapidly from the circulation. Its rate of removal was at no time exponential, however, but showed continual retardation in both treated mice and controls.

Although B.C.G.-infected mice were hypersusceptible to endotoxin, they were more resistant to infection with *S. enteritidis*, as measured by the mean survival time. Suspensions of this organism labelled with <sup>51</sup>Cr were cleared from the blood twice as rapidly as normal in the B.C.G.-treated animals. Their removal was exponential for the first 5 min. and then started to slow up.

The rate of catabolism of CA<sup>131</sup>I by Kupffer cells was increased in the B.C.G.-treated group.

The possible relationship of activation of the r.e.s. to the phenomena of tolerance to endotoxins and stimulation of non-specific immunity is discussed.

Moran, A. B. (1959). **Salmonella in animals: a report for 1957.**—Avian Diseases 3, 85-88. 29

63 salmonella types were demonstrated in 850 strains from animal sources in the U.S.A. in 1957. There were also 155 strains belonging to the Arizona group.—M.G.G.

Olsson, B. (1959). **Studies on the formation and absorption of antibodies and immune globulins in piglets. I. The formation of H agglutinins in piglets after vaccination with Salmonella paratyphi A.**—Nord. VetMed. 11, 250-273. [In English. Summaries in German and Swedish.] 30

Earlier investigations in man, cattle, sheep, pigs and fowls are reviewed and personal investigations with *Salmonella paratyphi A* OH vaccine are described. In all of 5 piglets vaccinated s/c during the 4th week of life there was a definite antibody response but measurable H agglutinin titres were demonstrable in only 2 of 4 vaccinated during the first week. Response to i/v injection at different ages was: at birth, no measurable H agglutinins demonstrable during 42 days; at 5 days 3 of 4 piglets had measurable H agglutinin titres 9-11 days later; at 7 days and over measurable H agglutinin titres were demonstrable in all of 7. The interval between vaccination and response decreased inversely with the age of the piglets. Results indicate that synthesis of H agglutinins starts as early as the 3rd week of life, and that the antibody-forming apparatus undergoes a functional maturing process. Re-inoculation with the same antigen elicited a definite antibody response in all the test animals.—T.E.G.R.

Antipin, V. I. (1959). [Vaccination of pregnant sows as a measure against swine paratyphoid.]—Veterinariya, Moscow 36, No. 7 pp. 45-49. [In Russian.] 31

Pregnant sows were given 3 i/m doses of 10, 15 and 15 ml. of formol vaccine against swine paratyphoid, with an interval of 8 days between the first and second injections and 20 days between the second and third. Agglutination titres developed in the blood and milk of the sows, and in the blood of the piglets after they had received colostrum. The milk titres fell within 20 days of farrowing. Eight piglets from vaccinated sows resisted oral infection with *Salmonella cholerae-suis* at 27 days of age, while 6 of 8 piglets from unvaccinated sows developed paratyphoid. Sows excreting *S. cholerae-suis* virulent for mice excreted

avirulent organisms 52 days after vaccination. It is recommended that vaccination of sows should begin between the 70th and 80th days of pregnancy, and that the piglets should be vaccinated at 20-25 days of age.—M.G.G.

Bövre, K. & Sandbu, P. (1959). **Salmonella excreting tortoises in Oslo.**—Acta path. microbiol. scand. 46, 339-342. [In English.] 32

Salmonella bacteria were isolated from faeces from 27 of 33 tortoises, most of them apparently healthy pets. 19 serological types were identified including two new ones: *adamstua* and *lindern*. All the strains isolated killed mice within 1-3 days after i/p injection. —R.M.

Joachim, A., Mayes, O. & Olarte, J. (1959). **The sensitivity of Salmonella species to synnematin B, chloramphenicol, and tetracyclines. A study of one hundred and ten freshly isolated strains.**—Antibiot. & Chemother. 9, 349-352. [Summary in Spanish. p. 382. Authors' summary modified.] 33

The action of synnematin B, chloramphenicol, tetracycline, oxytetracycline, and chlortetracycline against 110 strains of *S. typhi-murium*, *S. oranienburg*, and other species was studied.

With a few exceptions the bacteria were highly sensitive to the five antibiotics. Eight strains were resistant to the tetracyclines, five to synnematin B, and one to chloramphenicol. The order of diminishing activity was: tetracyclines, synnematin B, and chloramphenicol. Variation in sensitivity had no apparent relationship to the serological type of salmonella tested.

Garren, H. W. & Hill, C. H. (1959). **Agglutinating antibody titers of young White Leghorns and Rhode Island Reds following inoculation with live and inactivated Salmonella gallinarum cultures.**—Poult. Sci. 38, 918-922. [Authors' summary modified.] 34

Agglutinating antibody determinations were made for White Leghorn, Rhode Island Red, and crossbred White Leghorn-Rhode Island Red chicks after inoculation with live and killed *S. gallinarum* cultures. White Leghorns consistently developed lower antibody titres than Rhode Island Reds whether in response to infection or to killed culture. Leghorn-R.I.R. crosses were intermediate between the two breeds in antibody titres but had almost the same marked resistance to fowl typhoid as the Leghorns.



Broomhead, C. L. & Mann, P. G. (1959). **A family outbreak of *Salmonella thompson* infection.**—Mon. Bull. Minist. Hlth Lab. Serv. 18, 124-127. 35

In the outbreak reported the source of infection was a "whip" prepared from raw eggs. *S. thompson* was isolated from a batch of eggs, and serological examination of the hens gave evidence of infection in the flock.

Anczykowski, F. (1958). Dalsze badania nad standardyzacją aglutynacji próbowkowej w rozpoznaniu brucelozy. I. Zawiesina. a) Zastosowanie antygenu barwionego. [**Standardization of the agglutination reaction for the diagnosis of brucellosis. I. Suspension. a) Stained antigen.**]—Roczn. Nauk rol. Ser. E. 68, 369-392. [In Polish. Summaries in English and Russian.] 36

Agglutination tests on 922 samples, comprising 463 serum (97 horse, 136 cattle, 102 pig, 40 rabbit, 53 g. pig, 24 fowl and 11 duck), 400 whey and 59 bull semen samples, using stained and unstained antigen suspensions, gave identical results in 68.1% of cases; in 24.8% positive reaction was obtained with stained but not with the unstained antigen and *vice versa* in 7.1% of cases. The author considers that the 2,3,5-triphenyl-tetrazolium chloride stained antigen enables a more accurate differentiation between specific and non-specific reactions and easier reading of the final titre.—M. GITTER.

Bürki, F. (1959). Kultureller Nachweis von Brucellen aus mikroskopisch (Köster) negativen Rindernachgeburten. 2. Serologische Untersuchungen, Kasuistik, Epidemiologie. [**Cultural demonstration of brucella in microscopically negative bovine placentas. II. Serology and epidemiology.**]—Schweiz. Arch. Tierheilk. 101, 186-203. [Summaries in English, French and Italian.] 37

The Köster stain revealed brucella in 112 of 1,189 placentas from cattle. Culture in W medium revealed the organism in a further 24, 23 of which (yielding 22 strains of *Br. abortus* and one *Br. intermedia*) are the subject of this article. They were usually recovered in small numbers (1-50 colonies). Most of them were virulent for g.pigs. Tests were made of sera and antigens from 19 of the 23 cattle. Only 3 sera agglutinated both homologous antigen and Weybridge 99 antigen at positive titres, but all 19 antigens were agglutinated by serum from cattle with brucellosis. Only 2 sera were positive to the Coombs test and one was positive to the c.f. test. Seven of the cattle had been

vaccinated with Strain 19, but the brucella recovered from them did not have the characteristics of Strain 19. Such infected cattle are considered unlikely to infect the rest of the herd since the number of brucella organisms expelled is small and particularly if farmers isolate calving animals as a routine measure, with destruction of the placenta and disinfection.—M.G.G.

Haskins, M. D., Stevens, J. W. & Howell, D. G. (1959). **The use of cortisone-treated mice for the evaluation of *Brucella abortus* (S. 19) vaccine.**—J. comp. Path. 69, 251-256. [Authors' conclusions modified.] 38

The susceptibility of mice to *Br. abortus*, Strain 544 was increased at least one thousand-fold after their treatment with cortisone. A description is given of methods employing mice for the testing of Strain 19 vaccine.

Gilman, H. L. & Wagner, W. C. (1959). **The evaluation of brucellosis vaccination at 4 and 8 months of age.**—Cornell Vet. 49, 399-408. [Authors' summary modified.] 39

The relative immunity in 14 calves vaccinated at 4 months of age was compared with that of a group of 13 vaccinated at 8 months of age. In the 4-month group, none aborted. Three became infected but calved normally. In the 8-month group, one aborted. Three others became infected. In the unvaccinated control group three of four became infected and aborted. The fourth heifer resisted infection. There appeared to be no significant difference in the immunity induced in the two groups.

Elberg, S. S. (1959). **Immunization against brucella infection. 7. Immunological and epidemiological studies in Córdoba, Spain.**—Bull. World Hlth Org. 20, 1033-1052. [Summary in French. Author's summary modified.] 40

The author tested a live vaccine prepared from the Rev I strain of *Brucella melitensis* against caprine brucellosis and determined the extent of natural infection in goats and man.

The vaccine significantly increased the resistance of the goats without inducing a carrier state, and the immunity persisted for at least 15 months.

Serum agglutination tests, milk ring tests, and milk culture tests showed that approx. 16-29% of goats were infected. Of 118 herds tested, 111 harboured infected animals.

Serum agglutination tests on human beings revealed that 25 of 880 (2.8%) had titres of



160 International Units (i.u.) or above. On the basis of a diagnostic titre of 80 i.u. or above, 7% of the population showed evidence of past or present infection.

Renoux, G. (1959). Études sur la brucellose ovine et caprine. XXII. Vaccination contre la brucellose de chèvres soumises aux conditions naturelles de l'infection. [Studies on ovine and caprine brucellosis, XXII. Vaccination of goats against natural infection.]—Arch. Inst. Pasteur Tunis 36, 143-155. 41

A flock of goats was set up, consisting of 6 vaccinated s/c 15 months previously with formalized *Br. melitensis* 53 H 38 adjuvant vaccine, 28 vaccinated a fortnight previously with this vaccine, 38 experimentally infected with *Br. melitensis* 9 months previously and 13 controls free from brucellosis. In the course of 20 months, comprising 2 gestations, there were 43 normal parturitions and 6 abortions or stillbirths in the 34 vaccinated goats, compared with 9 normal parturitions and 6 abortions or stillbirths in the 13 controls. None of the foetuses aborted by vaccinated goats yielded *Br. melitensis*, but agglutinins against *Rickettsia burneti* were demonstrated in the dams. All other aborted foetuses yielded *Br. melitensis*. Bacteriological examination of the kids revealed light infection with *Br. melitensis* in 2 of 44 from vaccinated dams, and massive infection in 9 of 15 from control dams. Excretion of the organism was demonstrated in the milk or vaginal secretion of 3 vaccinated, 7 control, and 22 of the 38 experimentally infected goats. It was concluded that this vaccine immunizes goats for at least 18 months and probably for 32 months.—M.G.G.

Glenchur, H., Hall, W. H. & Zinneman, H. H. (1959). Blocking antibodies in rabbits infected with *Brucella melitensis*.—Proc. Soc. exp. Biol., N.Y. 101, 422-425. [Authors' summary modified.] 42

Six rabbits were infected i/v with a single massive dose of *Br. melitensis*. Three were treated by s/c administration of streptomycin and tetracycline for 2 weeks and 3 were left untreated. In untreated rabbits gamma globulin content of their serum greatly increased, and it was not appreciably changed by absorption with killed whole *Br. abortus* cells. In addition, the blocking phenomenon was demonstrated in low titres in serum of these rabbits by 29 days after infection. Antibiotic therapy was effective in preventing the rise of gamma globulins and of blocking antibody for up to 59 days.

Khodzhaev, S. (1959). [Immunity of guinea pigs inoculated with strain BA vaccine to repeated infection with *Brucella melitensis*.]—Bull. Biol. Med. exp. U.R.S.S. 47, No. 4 pp. 90-95. [In Russian. Summary in English.] 43

When g.pigs were inoculated with 1,000 million organisms of the BA variant of *Br. abortus* Strain 19, 80% resisted single s/c challenge with 20 organisms of virulent *Br. melitensis*. If challenge was repeated after a month only 30% resisted it, while if it was repeated a third time none resisted.—R.M.

Alton, G. G. (1959). *Brucellosis in Malta. II.*—Brit. vet. J. 115, 251-260. [Author's conclusions modified.] 44

The living attenuated vaccine developed by Elberg & Faunce (1957) is safe to use on the non-pregnant female Maltese goat either in early or adult life. The vaccine causes no appreciable interference with health or milk yield and local reactions are minimal. It has two serious drawbacks: a severe and prolonged sero-agglutination reaction and occasional excretion of small numbers of bacilli in the milk of goats vaccinated during lactation.

A high degree of immunity was demonstrated in goats exposed to very heavy natural infection during and immediately after the pregnancy following vaccination. A small number of vaccinated goats excreted *Br. melitensis* from the vagina after normal parturition, but for a shorter period than in non-vaccinated infected goats.

Meyer, M. E. & Cameron, H. S. (1959). *Comparative metabolism of species and types of organisms within the genus Brucella.*—J. Bact. 78, 130-136. [Authors' summary modified.] 45

The differential effect of thionin and basic fuchsin upon the growth of organisms within the genus *Brucella* has been the most valuable technique for species identification. The original classification of *Brucella* into three species was, in fact, based upon their growth pattern on these dyes by Huddleson in 1929. The existence of three definable species was serologically confirmed by Wilson & Miles in 1932. Organisms that fail to conform biochemically or serologically to species criteria can now be accommodated taxonomically in the enlarged schema. That this classification is biologically sound is reflected in the differing metabolic patterns of the organisms within the

species and types, especially when correlated with the bacteriostatic action of the dyes and H<sub>2</sub>S production.

Bürki, F. (1959). Ein Fall von Leptospiiren-Abort beim Schwein. [**Leptospiral abortion in a sow.**]—Schweiz. Arch. Tierheilk. 101, 234-237. [Summaries in English, French and Italian.] 46

*Leptospira pomona* was isolated from an aborted pig foetus. It is recommended that the serum of aborting sows in Switzerland should be tested for leptospiral antibodies.—M.G.G.

Michna, S. W. (1959). The survival of *Leptospira canicola* in the renal tissue of a pig.—Vet. Rec. 71, 549-552. [Author's summary modified.] 47

For 7 days *post mortem*, motile *L. canicola* organisms were demonstrated in fluid obtained after maceration of infected pig kidneys that had been stored at 0° to 4°C., but on the 8th and 9th days only non-motile forms of the organism were seen. When macerated material was subsequently kept at room temp., leptospirae were numerous and actively motile for a further 1 to 3 days. Motility was inhibited when the pH of the tissue approximated 5.5 and organisms disappeared within 24 to 48 hours in fluid of pH 5.8, or lower. On the 2nd and the 5th day of storage at 0° to 4°C. the reaction of renal tissue was pH 6.735 and leptospirae were recovered for up to 12 days after death.

Kiesel, G. K. & Dacres, W. G. (1959). A study of *Leptospira pomona* bacterin in cattle.—Cornell Vet. 49, 332-343. [Authors' summary modified.] 48

The use of a commercial killed *L. pomona* vaccine in an infected herd and in experimental animals placed in the infected herd is described.

Vaccination with a killed vaccine does not raise the blood titre significantly, although protection may be afforded.

Vaccinated animals do not have as great a rise in antibody titre after exposure or challenge as non-vaccinated animals.

Vaccination does not prevent subclinical infections and leptospiruria.

Calves born in an infected herd are immune for the first month or two of their lives. It is assumed that with continued exposure they may develop a lasting active immunity.

Yanagawa, R., Hiramune, T., Shimizu, T. & Ishii, S. (1959). Cultural studies on leptospirae.

I. On the growth of leptospirae in liquid medium inactivated at 100°C and 121°C.—Jap. J. vet. Sci. 21, 173-176. [In English. Summary in Japanese. Authors' summary modified.] 49

Tryptose-phosphate broth was subjected to high temperature after addition of rabbit serum. Growth of *Leptospira icterohaemorrhagiae* was generally better in media inactivated at 100°C. or 121° than in those inactivated at 56° or not inactivated. The same phenomenon was observed in media to which was added horse, cattle or sheep serum. In media inactivated at 121°, however, poor growth or inhibition of the leptospire occasionally occurred.

Tan, Hok Seng. (1959). Bovine genital vibriosis.—Thesis, Cornell pp. 78. 50

The author reviews the literature of bovine genital vibriosis.

Eleven heifers of various ages were used to study infectivity, and methods of diagnosis.

The blood agglutination test is unreliable. The vaginal mucus test became positive in most of the animals 5-6 weeks after intravaginal inoculation with *V. fetus* and was still positive at the end of 12 weeks. During oestrus, the heifers seemed to be more resistant to intravaginal exposure. This may be due to greater resistance to infection of the genital tract while under the influence of oestrogen.

—HERBERT L. GILMAN.

McEntee, K., Gilman, H. L., Hughes, D. E., Wagner, W. C. & Dunn, H. O. (1959). Insemination of heifers with penicillin- and dihydrostreptomycin-treated frozen semen from *Vibrio fetus* carrier bulls.—Cornell Vet. 49, 175-183. 51

Frozen semen from which catalase-positive vibrios had been isolated, was diluted to at least 1:25 and 500 units penicillin and 500 µg. dihydrostreptomycin added per ml. 41 heifers were inseminated once, 8 twice, 8 three and 4 four times. Vaginal and cervical mucus was examined by culture and by agglutination tests. Semen was held for about 5 months before use. Only 2 heifers became infected and these only very mildly. It is admitted that prolonged storage alone may have adversely affected the vibrio content of the semen [and no controls were inseminated with antibiotic-free material].

—F. L. M. DAWSON.

Möhlmann, H. & Dehmel, H. (1959). Die Entwicklung von Toxin und Antigen in



Tetanus-Bouillonkultur. [**Formation of tetanus toxin and antigen in broth culture.**]

—Arch. exp. VetMed. 13, 61-64. 52

In broth cultures of *Clostridium tetani* the toxin content was high after 4-7 days and changed little in the following 3 weeks, whereas the antigen content rose slowly and reached a peak in 2-3 weeks.—M.G.G.

Eyseev, V. A. (1959). [**Non-specific resistance to tetanus toxin in rats of differing type of nervous system.**].—J. Microbiol., Moscow 30, No. 8 pp. 45-50. [In Russian. Summary in English.] 53

It was suggested that animals with greater activity of the cerebral cortex were more resistant to tetanus toxin than animals with a weaker type of nervous system.—R.M.

Prérot, A.-R., Montloin, R.-J. & Sillio, R. (1959). Nouvelles recherches sur la vaccination antitoxique du vison. [**Further research on vaccination of mink against botulism.**].—Bull. Acad. vét. Fr. 32, 147-152. 54

100 mink were vaccinated s/c with 0.5 ml. of concentrated adsorbed toxoid prepared from *Cl. botulinum* C $\beta$  toxin [see V.B. 28, 2433]. They were not all protected against challenge 3 months later with 10,000-120,000 s/c lethal doses for mice. A dose of 1 ml. is recommended, to be repeated after a year.

—M.G.G.

Melby, J. C. & Spink, W. W. (1959). **Enhancement of lethal action of endotoxin in mice by triiodothyronine.**—Proc. Soc. exp. Biol., N.Y. 101, 546-547. [Authors' summary modified.] 55

The enhancement may be due to anoxia caused by vasoconstriction and subsequent hypotension that is induced by the endotoxin; and the increased demand for oxygen that is produced by triiodothyronine.

Shewell, J. & Long, D. A. (1959). **The influence of the thyroid gland on antitoxin production in different species.**—J. Hyg., Camb. 57, 202-209. [Authors' summary modified.] 56

The influence of the thyroid gland on the production of antitoxins to two alum-precipitated bacterial exotoxins was studied.

Rats, rabbits and mice produced more circulating antitoxin when thyroidectomized, and less when made hyperthyroid by thyroxine administration, than control animals. G.pigs produced slightly less antitoxin when thyroidectomized, and markedly more when thyroxine treated, than control animals.

Vallée, A. & Delrieu, A. (1959). Étude bactériologique des métrites de la chienne et de la chatte. [**Bacteriological study of metritis in bitches and cats.**].—Rec. Méd. vét. 135, 195-198. [Summaries in English and Spanish.] 57

57 bacterial strains belonging to ten species were isolated from the uterus of 24 bitches and 22 cats with metritis. 35 strains were *Escherichia*, 28 of these *E. coli*. *Pasteurella septica* and *Salmonella typhimurium* were each recovered from a cat.

—M.G.G.

Månsson, I. & Niléhn, P.-O. (1959). **Sensitivity of bacteria isolated from veterinary clinical material to various antibiotics.**—Nord. VetMed. 11, 289-297. [In English. Summaries in German and Swedish.] 58

Sensitivity to antibiotics was tested in 255 strains of bacteria isolated from dogs and horses with infections many of which did not respond to antibiotic treatment. Most of the strains were resistant to some of the antibiotics, but none was resistant to all. Few were resistant to erythromycin (15%), but many were to oxytetracycline (61%) and chlortetracycline (58%).—M.G.G.

Rutenburg, A. M., Sonnenblick, E., Koven, I., Schweinburg, F. & Fine, J. (1959). **Comparative response of normal and cirrhotic rats to intravenously injected bacteria.**—Proc. Soc. exp. Biol., N.Y. 101, 279-281. [Authors' summary modified.] 59

Bacteria labelled with radio-iodine infused into the portal vein of normal rats were promptly cleared and destroyed with release of ionic I<sup>131</sup> and its prompt excretion into the urine. In cirrhotic rats the clearance process was normal, but capacity to destroy bacteria was impaired. This resulted in persistence of ingested bacteria and of "bacteria bound" radioactivity in liver, lung, and spleen, and continued re-seeding of the blood stream from such foci.

I. Burns, J. & Holtman, D. F. (1959). **Tennecetin: A new antifungal antibiotic. General characteristics.**—Antibiot. & Chemother. 9, 398-405. [Summary in Spanish. p. 444.] 60

II. Barr, F. S. (1959). **Tennecetin: A new antifungal antibiotic. Toxicological studies.**—Ibid. 406-408. [Summary in Spanish. p. 445. Authors' summaries modified.] 61

I. A species of the genus *Streptomyces*, differing from those previously classified, was isolated from soil and produced an antifungal



antibiotic, designated tennecetin. The antibiotic had a wide antifungal spectrum *in vitro*.

II. The acute and chronic toxicity of tennecetin is reported for six species of laboratory animals. It was toxic when used by injection but not when given by mouth.

Pine, L. & Watson, S. J. (1959). **Evaluation of an isolation and maintenance medium for *Actinomyces* species and related organisms.**—J. Lab. clin. Med. **54**, 107-114. [Authors' summary modified.] 62

The medium contained over 30 ingredients, including minerals, purines, pyrimidines, vitamins, yeast extract, cysteine and "Casitone". It was superior to brain-heart infusion agar and Garrod's starch medium for maintenance and isolation of actinomycetes (including *Actinomyces bovis*) from clinical material. It also supported excellent growth of *Corynebacterium acnes*, *C. liquefaciens*, *Lactobacillus bifidus*, and *Leptotrichia buccalis*.

Bailey, W. S. & Groth, A. H., Jr. (1959). **The relationship of hepatitis X of dogs and moldy corn poisoning of swine.**—J. Amer. vet. med. Ass. **134**, 514-516. 63

The hepatitis previously described [V.B. **26**, 913] occurred in dogs as a result of feeding certain samples of a commercial dog food, and was similar to mouldy maize poisoning in pigs. Experimental feeding of dogs with mouldy maize which had caused mortality in pigs, produced toxic hepatitis indistinguishable from "hepatitis X". In a further outbreak of mouldy maize poisoning in pigs, feed produced from the same mouldy maize yielded a *Penicillium* and an *Aspergillus* and produced hepatitis when fed to a dog for 34 days.

—A. ACKROYD.

İşildar, B. (1959). Keçi ciger ağrisına karşı yeni canlı attenüe bir aşı üzerinde araştırmalar. [Preparation of vaccine against caprine pleuropneumonia by passage of the causal agent in Priestley's liquid medium.]—Türk. vet. Hekim. dern. Derg. **29**, 356-364. [In Turkish. English summary modified.] 64

The goat PPLO formalized tissue vaccine made in Turkey has been found very unsatisfactory by several practitioners. Therefore research was carried out to prepare an effective vaccine.

An attenuated strain was obtained through 74 successive subcultures of the pathogenic goat PPLO in Priestley's liquid medium.

Using this attenuated strain a live vaccine was prepared.

The vaccine was proved immunogenic in 9 goats by exposure to infection, whereas two control animals were infected and died.

I. Price, K. E. & Zolli, Z., Jr. (1959). **The influence of dietary calcium-phosphorus and terephthalic acid on antibiotic control of experimental infectious synovitis.**—Avian Diseases **3**, 135-156. 65

II. Price, K. E. & Zolli, Z., Jr. (1959). **The influence of terephthalic acid on oxytetracycline serum levels in chickens. Studies on mode of action. I.**—Ibid. 157-169. 66

I. Whilst oxytetracycline and chlortetracycline at 200 g./ton of ration did not always protect chicks against experimental infectious synovitis, the addition of terephthalic acid at a concentration of 0.3-0.4% to food containing chlortetracycline (100 g./ton) almost completely controlled it. A similar enhancement in the control of infectious synovitis by oxytetracycline was achieved by reducing the dietary calcium level to 0.18% during the treatment period. Simultaneous application of both antibiotic potentiation methods resulted in an additive increase in antibiotic efficacy. The response of a severe infection to therapy was closely correlated with the antibiotic serum concentration.

II. When compared with similar doses of oxytetracycline (OTC) alone, terephthalic acid given with OTC to chickens either into a ligated duodenal loop or s/c, increased the serum and liver levels and depressed the urine levels of OTC. This was not due to a diuretic effect. When glucosamine (which increases OTC absorption in the intestines) was given as well, OTC serum levels further increased. The sodium salt of terephthalic acid s/c but not i/m or i/v also increased OTC serum levels. Liver concentrations were significantly enhanced by all routes of administration and urine levels of antibiotic were significantly depressed. The maximum excretion retarding effect appeared to occur during the first 2 hours after injection. Terephthalic acid given s/c after intestinal absorption of antibiotic had been stopped by ligation of the duodenal blood vessels, produced consistent although non-significant increases in OTC serum levels above those of controls. Isomers and structurally related compounds did not increase OTC serum levels.—A. ACKROYD.

Clark, R. T. J. (1959). A dextran-fermenting organism from the rumen closely resembling *Lactobacillus bifidus*.—J. gen. Microbiol. 20, 549-553. [Author's summary.] 67

An organism which ferments the dextran of *Streptococcus bovis* was isolated from the rumen of cows on a diet of fresh clover. The bacterium is a strictly anaerobic Gram-positive, non-sporing, branching rod that closely resembles *Lactobacillus bifidus*. It is of interest from the point of view of the metabolism of dextran in the rumen.

See also absts. 194 (relationship between some bacteria, protozoa and diet in calves); 316 (book, bovine TB. in the U.S.A.).

### DISEASES CAUSED BY PROTOZOAN PARASITES

Seidel, E. (1959). Kurzer Überblick über wichtige tierpathogene Protozoen in China. [Brief survey of protozoa pathogenic for animals in China.] — Tierärztl. Umsch. 14, 84-88. 69

A search of the literature revealed the following important protozoan parasites of animals in China: *Entamoeba histolytica* in dogs; *Amoeba meleagridis* in turkeys and fowls; *Leishmania donovani* and, more rarely *L. tropica*, in dogs; *Trypanosoma evansi*, particularly in horses and buffaloes, and *T. theileri* in cattle; *Eimeria* spp. in cattle, rabbits and fowls; *Babesia bigemina* causing high mortality in imported European cattle; *Babesia ovis* in sheep; *Babesia canis* in dogs; and *Theileria parva*, *Th. mutans*, *Anaplasma centrale* and *A. marginale* in cattle.—M.G.G.

I. Ashcroft, M. T. (1959). The Tinde experiment: a study of the long-term cyclical transmission of *Trypanosoma rhodesiense*.—Ann. Trop. Med. Parasit. 53, 137-146. 70

II. Ashcroft, M. T., Burt, E. & Fairbairn, H. (1959). The experimental infection of some African wild animals with *Trypanosoma rhodesiense*, *T. brucei* and *T. congolense*.—Ibid. 147-161. [Authors' summaries modified.] 71

I. A strain of *T. rhodesiense* has been cyclically transmitted 120 times by *Glossina morsitans* through sheep for 23 years. Its virulence increased by transmission through monkeys and antelope and decreased by transmission through sheep.

An attempt was made to explain the relationship between the morphologically identical *T. rhodesiense*, *gambiense* and *brucei*. It was suggested that *rhodesiense* and *gambiense* were basically the same parasite, and that their

Adams, E. W., Lyles, D. I. & Cockrell, K. O. (1959). Eperythrozoonosis in a herd of pure-bred Landrace pigs.—J. Amer. vet. med. Ass. 135, 226-228. [Authors' summary modified.] 68

A spontaneous outbreak of eperythrozoonosis in a herd of pigs is described. An account is given of the course of infection in 2 splenectomized pigs inoculated with fresh blood from field cases during the latent phase of the disease. The authors discussed the natural and the experimental disease which they compared with the disease as recorded from other areas.

physiological differences were due to existence in different hosts. *T. brucei* was distinct in that it can never infect man, but it had physiological properties similar to *T. rhodesiense* because both are primarily parasites of animals.

II. Attempts were made to infect wild pigs, porcupines, several species of antelopes and monkeys with *T. rhodesiense*, *brucei*, and *congolense*.

New evidence is recorded on the close similarity between *T. rhodesiense* and *T. brucei* infections in wild animals.

In one bush-pig *T. rhodesiense* persisted for nearly a year. It was apparently latent for over three months and subsequently was always cryptic.

Lab. infections set up in wild animals by *T. rhodesiense* and *T. brucei* fall into groups, according to the degree of susceptibility of the host.

Species which are killed by *T. rhodesiense* and *T. brucei* are not fed upon to any great extent by tsetse-flies in nature. Tolerant hosts include those habitually fed upon, but high resistance does not correspond with the importance of the host as a source of food for the flies.

The number of infected flies found in nature may bear a relation to the species or groups of species of animals acting as hosts of the flies.

Wild pigs are probably more favourable as hosts for some other species of pathogenic trypanosomes than they are for those of the *T. brucei* group.

Lundholm, B. D., Storz, J. & McKercher, D. G. (1959). *Trypanosoma theileri* as a contami-



**nant of tissue origin in cultures of fetal bovine kidney cells in vitro.**—Virology 8, 394-396. 72

*T. theileri* non-pathogenic for g.pigs and mice was demonstrated in a primary culture of kidney cells from a bovine foetus. It is considered that protozoa are potential contaminants of tissues from certain mammals which might interfere with tissue culture work in countries where protozoan infections are common.—M.G.G.

Stephen, L. E. & Mackenzie, C. P. (1959).

**Experimental Trypanosoma vivax infection in the horse.**—Vet. Rec. 71, 527-530 & 531.

[Authors' summary modified.] 73

An experimental fly-transmitted infection with *T. vivax* in a horse is described with details of clinical signs, haematology, and clinical chemical examinations.

The infection was characterized by a series of peaks of parasitaemia accompanied by pyrexia, polypnoea, tachycardia, oedema of the legs, hydrocele, and muscular tremors.

Urticarial swellings and icterus appeared early and occurred throughout the infection. As the disease progressed appetite diminished, severe anaemia developed, and the horse became dull and weak with marked loss of condition and had a swaying gait.

Clinical chemical studies revealed elevated serum bilirubin, gamma-globulin and plasma specific gravity readings, and a positive formol gel test during the course of the infection.

The infection was cured with ethidium bromide injected i/m as a 2% soln., at a dose rate of 1 mg. per kg. body wt.

Goble, F. C., Ferrell, B. & Stieglitz, A. R. (1959). **The virulence and drug susceptibility of certain strains of trypanosomes of the brucei-evansi group maintained by syringe passage.**—Ann. Trop. Med. Parasit. 53, 189-202. [Authors' summary modified.] 74

Virulence and drug susceptibility were studied of 10 strains of *T. brucei*, *gambiense*, *rhodesiense* and *equiperdum*. Drug susceptibility varies within the group; difference between substrains is sometimes greater than that between species.

Strains passed through mice for 22, 37 and 62 years continue to be pathogenic for g.pigs.

Substrains which have broad resistance to drugs show a lowered pathogenicity for non-rodent hosts.

Lowered susceptibility to one drug, however, is not reflected by any measurable lower-

ing in pathogenicity for non-rodent hosts.

Prolonged syringe passage in mice does not inevitably lead to inordinate sensitivity to arsenicals or to other drugs.

Fife, E. H., Jr. & Muschel, L. H. (1959).

**Fluorescent-antibody technic for serodiagnosis of Trypanosoma cruzi infection.**—Proc. Soc. exp. Biol., N.Y. 101, 540-543.

[Authors' summary modified.] 75

While non-specific staining regularly occurred in dried smears of trypanosomes, specificity was excellent when reactions were conducted in test tubes to prevent drying of the organisms. The fluorescent-antibody procedure used independently or in conjunction with the complement-fixation reaction could be used for and can play an important role in serodiagnosis of *T. cruzi* infection. An improved method for purifying antibody prior to conjugation with fluorescein is also given.

Soltys, M. A. (1959). **Immunity in trypanosomiasis. III. Sensitivity of antibody-resistant strains to chemotherapeutic drugs.**—Parasitology 49, 143-152. [Author's summary modified.] 76

Antibody-resistant strains are less sensitive to suramin and antrycide than antibody-sensitive strains. When living trypanosomes were exposed to suramin and antrycide *in vitro*, antibody-resistant strains needed 50 times more of the drugs than antibody-sensitive trypanosomes to make them non-infective for mice. In mice the minimal therapeutic dose for antibody-sensitive strains was 0.1 mg. but for resistant strains it was 0.3 mg./20 g. body wt. Rabbits treated with suramin resisted infection with the antibody-sensitive strain for 4 months, but failed to resist infection with the antibody-resistant strain after 2 months.

Rabbits treated with antrycide pro-salt, resisted infection with antibody-sensitive strains for 2 months, but failed to resist infection with the antibody-resistant strain even 1 month after injection with the drug. Although trypanosomes can become drug resistant without being antibody resistant it is suggested that, under natural conditions, drug-resistant strains in animals and man develop from antibody-resistant strains, particularly when trypanostatic drugs are used. In conclusion it is suggested that trypanosomes which are exposed for some time to antibodies and become antibody resistant after passage through animals like rabbits, as well as those

strains frequently passaged through mice, should be used in all tests for the efficiency of chemotherapeutic drugs.

Hoare, C. A. (1959). **Morphological and taxonomic studies on mammalian trypanosomes. IX. Revision of *Trypanosoma dimorphon*.**—*Parasitology* 49, 210-231. [Author's summary modified.] 77

There have always been doubts about the identity of *T. dimorphon*, which is commonly regarded as a synonym of *T. congolense*. The occurrence of atypical strains, with characters like those of *T. dimorphon* has reopened the question of the independence of this species.

To solve this problem, the author has undertaken a complete revision of *T. dimorphon*, based on Laveran and Mesnil's original type material. In the course of this work, a total of 1,200 trypanosomes passaged in animals in the course of 4 years, were studied biometrically and morphologically.

It was shown that the structure of *T. dimorphon* is comparable to that of *T. congolense*, but it differs from the latter in greater length, its range being 11-24  $\mu$ , while the means in different populations vary from 15.3 to 17.6  $\mu$ . Although certain characters (*e.g.* shape of posterior end of the body and position of nucleus) seem to be correlated with length of the trypanosomes, there is a gradual transition between the different forms. Moreover, the majority of samples proved to be homogeneous populations with normal length distributions. Therefore *T. dimorphon* is regarded as a monomorphic species.

In a review of previous records, strains which had been erroneously assigned to *T. dimorphon* have been separated from those conforming to this species, which probably has wide distribution in Africa.

From a comparison of *T. dimorphon* with other species of the *congolense* group it is seen that it can be distinguished from *T. simiae* by a number of morphological features, while it differs from *T. congolense* mainly in the range of mean lengths, the two species falling into two distinct groups, whose mean measurements do not overlap.

It is concluded that *T. dimorphon* should be removed from the synonymy of *T. congolense* and restored to its original position as an independent species. The characteristics of the *congolense* group have been amended accordingly.

Lamy, L. (1959). Milieu de culture simplifié pour *Trichomonas foetus*. [A simplified medium for cultivation of *Trichomonas foetus*.]—*Ann. Inst. Pasteur* 97, 115-116. [Summary in English.] 78

A strain of *Tr. foetus* has been cultivated for several years at 37°C. in a liquid medium, initial pH 7.2-7.4, consisting of 7 parts Ringer's soln. and 1 part horse serum with a trace of rice starch. The organism is transferred to fresh medium every week.—M.G.G.

Starzyk, J., Waclawek, D. & Haslinger, R. (1959). Wplyw wyciągu wodnego z *Pulsatilla pratensis* na *Trichomonas foetus* Ried in vitro. [Effect of aqueous extract of the anemone *Pulsatilla pratensis* on *Trichomonas foetus*.]—*Med. Wet.*, Warszawa 15, 266-268. [In Polish. Summaries in English and Russian.] 79

A 1:2 dilution of an aqueous extract prepared from fresh leaves of *P. pratensis* was lethal within 30 min. for *Tr. foetus* grown on Schneider's medium. The effect of the extract did not depend upon the age of the culture but on the duration of exposure to the extract. —M. GITTER.

Hibler, C. P., Hammond, D. M., Caskey, F. H., Johnson, A. E. & Fitzgerald, P. R. (1959). **The morphology and incidence of the trichomonads of swine.**—*J. Prot.* 6, Suppl. p. 7. [Authors' abst. modified.] 80

A trichomonad resembling *Tr. foetus* was found in the caecum of 43% of 496 pigs (15% by direct examination), in the small intestine in 3% of 100 pigs (all by culture), in the stomach in 8% of 512 pigs (1% by direct examination), and in the nose in 55% of 100 pigs (all by culture). No appreciable difference in morphology or response to cultivation could be distinguished among these trichomonads. Therefore, they are considered as belonging to the same species, *Tr. suis*.

Two other trichomonads, briefly described by Buttrey [*J. Prot.* 3, 8-13 (1956)] were usually found only in the caecum. One of these was of *Tr. prowazeki* type.

Challey, J. R. & Burns, W. C. (1959). **The invasion of the cecal mucosa by *Eimeria tenella* sporozoites and their transport by macrophages.**—*J. Prot.* 6, 238-241. [Authors' synopsis modified.] 81

The establishment of *E. tenella* sporozoites in the caecal mucosa of the chicken was similar to that reported for *E. necatrix* by Van Doorninck & Becker [*V.B.* 27, 2973].



Sporozoites passed through the surface epithelium of the caecal mucosa into the lamina propria. Within the lamina propria the sporozoites were engulfed by macrophages and transported to the cells of the glands of Lieberkühn. Sporozoites developed within the gland epithelium.

Siegmann, O. (1959). Vergleichende Therapieversuche bei experimenteller Blinddarmcoccidiose der Küken. [**Comparative therapy of experimental caecal coccidiosis in chicks.**]—Berl. Münch. tierärztl. Wschr. 72, 215-220. [Summary in English.] 82

Nitrofurazone and 4 sulphonamides were given in drinking water of chicks with experimental coccidiosis, treatment beginning 72 or 100 hours after infection. Nitrofurazone was of the least therapeutic value. Sulphadimidine and sulphaquinoxaline were the most effective in reducing mortality and the excretion of oocysts.—M.G.G.

Ball, S. J. (1959). **Antibiotics in chemotherapy of caecal coccidiosis in chickens.**—J. comp. Path. 69, 327-333. [Author's conclusions.] 83

Aureomycin, chloramphenicol, erythromycin, spiramycin and terramycin were active against severe experimental infections of *E. tenella*. When administered before infection, spiramycin proved the most effective, and erythromycin and chloramphenicol the least active. When treatment was delayed up to 2 days after infection spiramycin was still effective.

Experiments indicated that aureomycin, chloramphenicol, spiramycin and terramycin did not interfere with the development of immunity to caecal coccidiosis in chicks infected with *E. tenella*.

Davis, L. R. & Smith, W. N. (1959). **Fluorescent powders and ultraviolet light for tracing inoculations of oocysts.**—J. Prot. 6, Suppl. p. 6. [Authors' abst. modified.] 84

For locating oocysts of coccidia in the digestive tract of animals after inoculation, the authors tried "daylight fluorescent" pigments.

When mixed with bentonite (2:1) and administered by capsule on consecutive days, 3 g. of pigment to a yearling calf and 2 g. to a lamb, the colours were detected in the digestive tract on the third day.

Pigment (2 g.) given in a drench to a lamb appeared in its faeces for 2 days, but on the third day could be detected only by ultra-violet light. The pigments might be used for

differentiating faeces of test animals from those of controls, locating faecal contamination of soil by specific animals, and possibly, for determining sites of injection of organisms, drugs, chemicals, and other substances.

Trager, W. (1959). **A new virus of ducks interfering with development of malaria parasite (*Plasmodium lophurae*).**—Proc. Soc. exp. Biol., N.Y. 101, 578-582. [Author's summary modified.] 85

During passage of *Pl. lophurae* in ducklings, a contaminating infective agent appeared which inhibited malarial infection and caused rapid death of ducks. The agent was present in the plasma and was readily separated from malaria parasites. It was a filtrable virus producing in ducks a rapidly fatal disease characterized by enlargement and necrosis of the spleen. The virus was neutralized by serum from a recovered immune duck but not by antiserum to duck hepatitis virus. In ducklings simultaneously inoculated with *Pl. lophurae* and virus development of malaria parasites was retarded and many of them appeared abnormal.

Schellner, H. & Vollbrechtshausen, R. (1959). Über diagnostische Untersuchungen bei Toxoplasmoseverdacht. [**Diagnosis of toxoplasmosis.**]—Berl. Münch. tierärztl. Wschr. 72, 203-206. [Summary in English.] 86

Sera from 78% of 2,309 human patients and 88% of 1,034 dogs with suspected clinical toxoplasmosis reacted to the dye test. Most negative and low titres and also most of the very high titres (1:64,000 and higher) were in young patients and puppies. High titres occurred in dogs that developed respiratory symptoms followed by cerebral disorders.

—M.G.G.

Groulade, P. & Vallée, A. (1959). Encéphalite chez un agneau avec présence de toxoplasmes. [**Encephalitis associated with toxoplasms in a lamb.**]—Bull. Acad. vét. Fr. 32, 135-136. 87

A lamb aged 3 months developed incoordination and a temp. of 40.5°C. a fortnight after vaccination against foot and mouth disease. Paralysis set in and was complete by the 6th day. The animal was killed on the 30th day. The only P.M. finding was an abundance of liquid around the brain. There was cortical and septal meningitis with the presence of toxoplasms which were also demonstrable in the brain and cerebellum.—T.E.G.R.

Armstrong, J. A. & Fulton, J. D. (1959).

**Observations on the pathology of toxoplasmosis in the cotton rat.**—Brit. J. exp. Path. 40, 225-231. [Authors' summary modified.] 88

An unusual penile secretion, in adult cotton rats after i/p infection with *T. gondii*, is accompanied by urethral obstructions and retention of urine. It appears to result from parasitic invasion and acute inflammation of the pelvic organs.

Hepatic lesions in cotton rats are unlike those in other rodents with toxoplasmosis. The significance of fatty infiltration of the liver was investigated and is discussed.

Oedema and parasitic infiltration of the skin is notable in many infected cotton rats, suggesting that cross infection by contact may be possible.

In tissue sections stained with acridine orange the parasites can often be located more easily by fluorescence microscopy than by ordinary staining methods.

Sheldon, W. H. (1959). **Experimental pulmonary *Pneumocystis carinii* infection in rabbits.** — J. exp. Med. 110, 147-160. [Author's summary modified.] 89

Interstitial pneumonitis with many *Pneumocystis* organisms was found in rabbits treated with cortisone and antibiotics and given an intranasal instillation of a suspension of lung tissue from either a human patient or a rabbit with this infection. Organisms and pulmonary lesions of similar severity and frequency were present in controls treated in the same manner but instilled with either saline or a boiled suspension of normal human lung tissue. The administration of antibiotics and infected rabbit lung suspension only, produced less marked lung changes with fewer organisms. Occasional organisms and minute foci of pneumonitis were encountered in normal rabbits which had received neither hormone, antibiotics, nor inoculum.

The pulmonary lesions in the cortisone-treated rabbits resembled closely the findings in patients with the subclinical form of *Pneumocystis* pneumonitis. The massive lesions of widespread *Pneumocystis* pneumonia in infants were not reproduced.

The findings indicate that latent pulmonary *Pneumocystis* infection was widespread in these rabbits but do not establish the transmission of the disease. The activation of latent

infection was dependent on an impairment of host resistance which in these experiments was produced most effectively by the administration of cortisone. The differences between the experimental lesions and those of typical *Pneumocystis* pneumonia in infants suggest that in man an unknown defect of host defences other than that induced by prolonged hormone administration accounts for the increased susceptibility to the infection. It is concluded that in the presence of widespread latent *Pneumocystis* infection the development of active disease is a manifestation of altered host resistance.

Komaritsyn, N. N. (1959). [Stimulation of blood formation in calves by administration of rumen infusoria.] — Proc. Lenin Acad. agric. Sci. 24, No. 7. pp. 44-48. [In Russian.] 90

Cud taken from the mouth of cows was fed several times a day to ten calves from the age of 2 to 12 days or 3 to 15 days. Stercobilin appeared on the 3rd-4th day of life in the blood of these calves, compared to about the 8th day in 12 control calves, and the average content rose to only 30 mg.% on the 14th day compared to 58 mg.% on the 24th day in controls. The haemoglobin content of the blood was 71% in test calves and 58% in controls and the number of erythrocytes 7.6 and 6.3 million, respectively, per cu. mm. of blood.

—M.G.G.

Oxford, A. E. (1959). **Bloat in cattle. XV. Further observations concerning the ciliate *Epidinium ecaudatum*, an inhabitant of the rumens of cows liable to legume bloat.**—N.Z. J. agric. Res. 2, 365-374. [Author's summary modified.] 91

*Epidinium ecaudatum* can slowly metabolize glucose, and to a lesser extent fructose, with production of amylopectin storage granules characteristically situated. The non-ionic "Pluronic" detergent L62, a mixed polymer of ethylene and propylene glycols, is lethal to *Epidinium* above a concentration of 0.05%. It is less harmful to the larger rumen holotrichs particularly when they are not well filled with storage polysaccharide. Introduction of L26 (25-75 ml.) into the rumen quickly brings about a diminution in the active ciliate population. *Epidinia* and the smaller rumen holotrichs seem most affected.



Gutierrez, J. & Davis, R. E. (1959). **Bacterial ingestion by the rumen ciliates *Entodinium* and *Diplodinium*.**—J. Prot. 6, 222-226. 92

See also absts. 160 (exp. concurrent infection in calves with coccidia and nematodes); 194 (relationship between some bacteria, protozoa and diet in calves).

## DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Sergieiev, P. G. & Sergeev, V. A. (1959). [Multiplication and cytopathic action of foot and mouth disease virus on monolayers of calf-kidney epithelium.]—Voprosy Virusologii 4, 218-221. [In Russian. Summary in English.] 93

Type A virus freshly isolated from infected pigs was passaged 20 times. Strong cytopathic action was seen after 4 passages. An experimental batch of adsorbed formalized vaccine was prepared from the 14th and 15th passages.—R.M.

Brown, F. & Graves, J. H. (1959). **Changes in specificity and electrophoretic mobility of the precipitating antibodies present in the serum of cattle recovering from foot-and-mouth disease.**—Nature, Lond. 183, 1688-1689. 94

Serum collected from cattle 7 days after infection possessed different properties when subjected to immune electrophoresis or chromatography than serum collected 21 days after infection. These differences were being examined in greater detail.—R.M.

Korn, G. & Truszczyński, M. (1959). Nachweis komplementbindender Antikörper nach Marucci in den Seren experimentell MKS-durchseuchter Rinder und Schweine sowie hyperimmunisierter und vakzinierter Rinder. **Demonstration of complement-fixing antibodies in the serum of cattle and pigs with experimental foot and mouth disease, and in hyperimmunized and vaccinated cattle.**—Arch. exp. VetMed. 13, 103-115. 95

Type specific c.f. antibodies were demonstrated, by the technique of Marucci [V.B. 28, 2119], in 20 cattle experimentally infected with types O<sub>2</sub>, A or C of F. & M. disease virus. In 6 the titres were followed until they disappeared about 3 months after infection. After re-infection with a different type of virus about 3 months after the first infection, several cattle developed heterologous antibodies to the previous type as well, and 2 cattle infected first with type A and later with type O showed no antibodies against type O, but only a reappearance of type A antibodies. In 14 cattle given repeated doses of virus, titres declined and

In cattle fed a high-starch diet, species of *Entodinium* and *Diplodinium* ingested rumen diplococci.—R.M.

were negative after 4-5 doses. Of 20 pigs infected with type O only 7 showed c.f. antibodies, 6 at low titres. No antibodies were found in 20 cattle vaccinated once against the disease, but 23 of 83 cattle vaccinated several times with trivalent vaccines showed antibodies against at least 2 types.—M.G.G.

Rogge, W. (1958). Antikörperbildung bei Maul- und Klauenseuche unter dem Einfluss von Temperaturschwankungen. [Influence of fluctuations in body temperature on antibody formation in foot and mouth disease.]—Inaug. Diss., Hanover pp. 28. 96

In 9 cattle hyperimmunized with F. & M. disease type A virus, rises and falls in body temp. in the following 6½ hours were not correlated with those in antibody titre. Fluctuations in antibody titre were large when the body temp. exceeded 39°C. and were usually small or did not occur when the temp. was stationary.—M.G.G.

Domański, E. & Fitko, R. (1958). Zaburzenia hormonalne i związane z nimi zakłócenia w płodności i laktacji u krów po przechorowaniu przyszczy. [Disturbances in reproduction and lactation in cows recovered from foot and mouth disease.]—Roczn. Nauk rol. Ser. E. 68, 333-352. [In Polish. Summaries in English and Russian.] 97

Five years' observations after outbreaks of F. & M. disease in 1952, revealed in recovered animals a tendency to emaciation or obesity, skin lesions and disturbances in the temperature regulation mechanism, lactation and fertility. Clinical symptoms, hormonal therapy trials and histological examinations suggested that the hypophysis was the site of primary dysfunction. Hyperthyroidism and deficient production of thyrotrophic hormone in the hypophysis were seen in the emaciated cows and the reverse in obese animals. In cows affected with anoestrus there was atresia of oocytes, deficient production of gonadotrophins and hypertrophy of the adrenal cortex. Agalactia was attributed to deficient secretion of luteinizing hormone and responded to parenteral administration of 100-150 mg. of the pure hormone.—M. GITTER.

Kötsche, W. & Veckenstedt, A. (1959). Zum Problem der Anpassung des Maul-und-Klauenseuche-Standard-A-Virus an das Zentralsystem der Maus. II. Mitteilung: Abhängigkeit von Anpassungsgrad und Blutbild. [**Adaptation of foot and mouth disease virus to the central nervous system of the mouse. II.**]—Arch. exp. VetMed. 13, 40-51. 98

Three series of passages of dermatotropic F. & M. disease standard A virus in mice were accompanied by a characteristic change in the neutrophile count. The first passage raised the count to 46-61%. This declined to normal (19-23%) in the next few passages, then progressively increased until by the 100th passage it was as high as in mice undergoing the 1,356th passage of neurotropic F. & M. disease A virus (78%). The lymphocyte count rose and fell in inverse ratio to the neutrophile count. It was concluded that the gradual increase in the neutrophile count reflected the adaptation of the virus to the c.n.s.—M.G.G.

Kötsche, W. (1959). Beitrag zur Frage der Abhängigkeit der Maul- und Klauenseuche von meteorologischen Faktoren. [**Dependence of foot and mouth disease on atmospheric conditions.**] — Arch. exp. VetMed. 13, 141-156. 99

Morbidity in mice experimentally infected with F. & M. disease was reduced by high atmospheric pressure, low humidity and low temp., and increased by falling pressure, high humidity and high temp. Continuous illumination or continuous darkness had no apparent influence.—M.G.G.

Campbell, C. H. (1959). **Antibody response of adult mice to virus of foot-and-mouth disease.**—Proc. Soc. exp. Biol., N.Y. 101, 286-288. [Author's summary modified.] 100

Normal adult female mice were inoculated with the virus of F. & M. disease, and sera obtained from these animals at intervals up to 3 months after inoculation were tested for neutralizing capacity. Neutralizing antibody was detected as early as 3 days after inoculation, increased gradually to a maximum at 20-30 days and persisted at a high level for the remainder of an 84-day period.

Skinner, H. H. (1959). **Infection of domestic poultry with the viruses of foot-and-mouth disease and vesicular stomatitis.**—Arch. ges. Virusforsch. 9, 92-126. [In English.] 101

Chickens, turkeys, guinea-fowl, ducks and geese could be infected with cattle and g.pig

strains of the virus of F. & M. disease and with the Ind C and NJ. M guinea-pig passaged strains of the virus of vesicular stomatitis. The lesions most commonly seen were on the dorsum of the tongue or on the main foot pads and fluid or epithelium from them was highly infective. They were most readily produced in birds in good condition by direct inoculation of virus into the epithelium at these sites and were similar in nature to those occurring in susceptible animals. Secondary lesions were occasionally observed in chickens infected with F. & M. virus and in geese infected with either virus. A primary antibody response was readily detected in geese clinically infected with either virus and in most chickens clinically infected with F. & M. virus. In chickens clinically infected with vesicular stomatitis virus, an antibody response was often not detected until after a second infection. This secondary antibody response was of value in detecting subclinical infections. Spread of infection amongst birds by contact was not observed. No clinical infections were seen in chickens or geese when placed in close contact with cattle infected with F. & M. virus, although one of the 16 chickens and 2 of the 8 geese developed antibodies, nor when large doses of this virus were given orally or nasally. In some chicks up to a week old given large doses of vesicular stomatitis virus orally or nasally, epithelial lesions did develop.—A. ACKROYD.

Bell, J. F. (1959). **Transmission of rabies to laboratory animals by bite of a naturally infected bat.** — Science 129, 1490-1491. [Author's summary modified.] 102

An insectivorous bat that attacked a man in western Montana was induced to bite unweaned mice. Subsequently the bat died, and brain and salivary gland suspensions were inoculated into other mice. Rabies virus was isolated from all three groups of mice.

Nicolau, S. S., Drăganescu, N., Nicolau, C. S., Fuhrer, B., Gird, E. & Ionesco, N. I. (1959). **A new-type of anti-rabies vaccine; investigations into the migration of the vaccine virus in the animal organism by means of radioactive substances.** — Acta virol., Prague 3, Suppl. pp. 91-96. [Authors' summary modified.] 103

A vaccine prepared by using fixed rabies virus attenuated by a 0.15% solution of silver nitrate proved as effective in mice and rabbits as attenuated virus.

Using a radioactive vaccine prepared with Ag<sup>110</sup>NO<sub>3</sub> its migration was followed in the



animal. Radioactivity of the sciatic nerve of the inoculated thigh was higher than that of any of 14 different tissues studied, thus demonstrating neurotropic affinity of the attenuated virus contained in the vaccine, although the latter was not pathogenic for mice on intracerebral inoculation.

Goldwasser, R. A., Kissling, R. E., Carski, T. R. & Hosty, T. S. (1959). **Fluorescent antibody staining of rabies virus antigens in the salivary glands of rabid animals.**—Bull. World Hlth Org. 20, 579-588. [Summary in French. Authors' summary modified.] 104

Staining with fluorescent antibody of street rabies antigens in smears made from the salivary glands of rabid animals is described. Salivary glands of 157 animals, including dogs, foxes, cats, pigs, cows, one squirrel and one rat, were examined by this method. In addition, staining was carried out for Negri bodies and virus isolation studies were made on the brains and salivary glands. Virus was isolated from brain in 55 animals. 51 of these had Negri bodies and 49 excreted virus in salivary glands. In 48 of the 49, smears made from six different areas of the glands reacted positively to fluorescent antibody.

von Magnus, P., Andersen, E. K., Petersen, K. B. & Birch-Andersen, A. (1959). **A pox-like disease in cynomolgus monkeys.**—Acta path. microbiol. scand. 46, 156-176. [In English. Authors' summary modified.] 105

Two outbreaks of a pox disease in a lab. monkey colony occurred late after arrival of the monkeys, *i.e.*, after 51 and 62 days, respectively, and only 20-30% of the animals developed clinical signs of disease.

The clinical manifestations were skin eruptions of a maculo-papular rash and variolous pustules. The general health of the animals was not seriously affected and there were no deaths.

A virus was isolated from the pustular lesions. This agent multiplied on the chick embryo chorio-allantoic membranes and produced cytopathic changes in tissue cultures of monkey kidney-, human amnion-, and HeLa cells. The monkey virus was serologically related to vaccinia and had the brick-shaped appearance typical for pox-viruses.

The monkey virus caused variola-like lesions on the chick embryo chorioallantois and on the scarified cornea of rabbits. However, unlike variola it could be maintained in serial intracerebral passages in mice causing encephalitis and in the rabbit skin where it

produced severe hemorrhagic lesions. It caused a fatal infection in 2-day-old rabbits with lesions in the liver and kidneys. Attempts to identify the monkey virus with any of the known pox-viruses failed.

A small percentage of tissue cultures from apparently healthy monkeys killed during the two outbreaks were contaminated with the monkey pox virus.

Ado, A. D. & Titova, S. M. (1959). **[Experimental influenza in dogs.]**—Voprosy Virusologii 4, 165-169. [In Russian. Summary in English.] 106

Puppies aged 4-7½ months were susceptible to infection with the "Shklyaver" strain of Type A influenza virus, particularly by aerosol or intravenous injection but also by contact with infected dogs. Infected puppies developed catarrhal inflammation of the upper respiratory tract, pneumonia, fever, leucopenia, changes in the electrocardiograph and in respirations; some died. Influenza virus was isolated from nasal mucus during the first week of illness by inoculation of embryonated eggs. Specific virus-neutralizing antibodies were found in the serum from the 2nd or 4th day of illness and persisted for up to 17 months. Puppies up to 2 months of age resisted infection. It was not stated what precautions were taken to exclude distemper. The amount of virus used for aerosol infection which succeeded in 9 of 10 dogs, was not stated, but a box with a volume of 0.73 cu. m. was used for this purpose.

For intravenous infection allantoic culture fluid having a haemagglutinin titre of 1:640-1:280 was given in a dose of 2 ml./kg. body weight. Altogether 22 puppies were used in the experiments.—R.M.

Hinz, R. W. & Syverton, J. T. (1959). **Mammalian cell cultures for study of influenza virus. I. Preparation of monolayer cultures with collagenase. II. Virus propagation.**—Proc. Soc. exp. Biol., N.Y. 101, 19-22 & 22-26. [Authors' summaries modified.] 107

I. Primary monolayer cultures of human, rabbit and porcine foetal and adult lung were prepared conveniently by dispersion of tissue with collagenase in phosphate-free salt solution.

II. Collagenase-dispersed human and porcine lung cells in primary culture unequivocally propagated human strains A and B, and swine influenza viruses, respectively. Porcine lung cells also propagated human influenza A viruses to some extent. Swine

virus infection destroyed, and human virus infection damaged less severely porcine and human lung cells respectively. Rabbit lung cells were insusceptible to human and swine influenza viruses. Porcine kidney cells propagated egg-infective swine influenza virus and haemagglutinin without cytopathogenic effect.

I. Shubladze, A. K., Gaïdamovich, S. Y. & Gavrillov, V. I. (1959). [Laboratory infections of man with the virus of Venezuelan equine encephalomyelitis.]—*Voprosy Virusologii* 4, 305-310. [In Russian. Summary in English.] 108

II. Slepishkin, A. N. (1959). [Epidemiological study of laboratory infection of man with the virus of Venezuelan equine encephalomyelitis.]—*Ibid.* 311-314. [In Russian. Summary in English.] 109

I. & II. Following accidental breakage of 9 ampoules of dried virus in the "Ivanovskii" Institute of Virology in Moscow, at least 20 lab. workers became infected and 14 of them became seriously ill.—R.M.

Bell, J. F. & Hadlow, W. J. (1959). Responses of newborn and adult domestic rabbits (*Oryctolagus*) to infections with Coxsackie viruses.—*J. infect. Dis.* 105, 54-60. [Authors' summary modified.] 110

Clinical signs or death did not occur when new-born rabbits were injected with 12 types of Coxsackie group A and 5 types of group B viruses. However, as measured by titrating rabbit torso preparations in unweaned mice, wide variations in proliferation of these viruses were observed. Certain types achieved titres as high as log. 7.6/0.03 ml., whereas others never exceeded log. 1.0. Likewise, considerable variation in the extent and severity of microscopic lesions was noted. Regardless of the type of virus injected, lesions were restricted to skeletal muscles and were comparable to those of the myodegeneration occurring in similarly infected unweaned mice. Also, wide variation in neutralizing antibody titres occurred in sera of adult rabbits hyperimmunized with rabbit torso suspensions. Titres of some sera were comparable to those of the best immune sera prepared in mice, whereas others had titres so low that they could not be used in routine tests.

Porterfield, J. S. (1959). Plaque production with yellow fever and related arthropod-borne viruses. — *Nature*, Lond. 183, 1069-1070. 111

In monolayer cultures of chick fibroblasts,

plaques of dead cells were produced by yellow fever, West Nile, Japanese B, Wesselsbron and louping-ill viruses. Louping-ill virus produced plaques which were indefinite until the seventh day, when they measured 2-3 mm. diam.

—R.M.

Byrne, R. J., Yancey, F. S., Bickley, W. E. & Finney, G. (1959). Epidemiological studies on equine encephalomyelitis in Maryland and Virginia.—*J. Amer. vet. med. Ass.* 13, 211-218. [Authors' summary modified.] 112

Two agents isolated in 1956, and one in 1958, from animals with clinical encephalomyelitis were subsequently identified as Eastern equine encephalomyelitis (EEE) virus. A post-epizootic survey of horses and ponies in Maryland and Virginia revealed a significant number of animals with EEE virus neutralizing antibodies. All attempts to isolate the virus from arthropods in 1957 and 1958 were unsuccessful.

Wagner, R. R., Snyder, R. M., Hook, E. W. & Luttrell, C. N. (1959). Effect of bacterial endotoxin on resistance of mice to viral encephalitis. Including comparative studies of the interference phenomenon.—*J. Immunol.* 83, 87-98. [Authors' summary modified.] 113

Purified endotoxin from *Salmonella abortus-equi* enhanced the resistance of mice to the viruses of Eastern equine encephalomyelitis (EEE) and encephalomyocarditis (EMC). In contrast to previous studies of "non-specific" resistance to bacterial infection or viral toxicity, a favourable outcome was also demonstrable when endotoxin was administered concomitantly with challenge virus or when treatment was begun 6 hours after i/p infection with EEE virus.

Endotoxin-induced resistance to the lethal action of EEE virus was accompanied by moderate inhibition of virus multiplication in brain. Endotoxin had no effect on multiplication of the virus in tissue culture, nor could it be shown to stimulate the production of an antiviral substance in brain.

Certain differences were noted between endotoxin-induced resistance to viral encephalitis and the viral interference phenomenon. Intracerebral injection of influenza virus caused striking resistance to infection with EEE virus and marked inhibition of virus multiplication in brain. Although the capacity of influenza virus to protect mice against infection with EMC virus was slightly greater than that of bacterial endotoxin, no effect could be demonstrated unless the inter-



fering virus was injected directly into the brain. Unlike bacterial endotoxin, influenza virus effectively suppressed multiplication of EEE virus in tissue cultures of chick embryo fibroblasts.

Daubney, R. (1959). **Suspected bovine malignant catarrh.**—*Vet. Rec.* **71**, 493. 114

Commenting on a report of suspected malignant catarrh in England [*Vet. Rec.* **71**, 191], D. stated that definite diagnosis could be made by histological examination of sections of brain, liver, kidney, and lung. Massive round-cell perivascular and periportal infiltration was pathognomonic. The causal agent was easily transmitted to rabbits.—A. ACKROYD.

Huygelen, C., van Tongeren, H. A. E. & Mortelmans, J. (1959). **Transmission experiments with a virus causing dermatitis and ulcerative stomatitis in cattle in Ruanda-Urundi. Identification of the virus.**—*Zbl. VetMed.* **6**, 154-161. [In English. Summaries in French, German and Spanish.] 115

A virus isolated from young cattle in Ruanda-Urundi [see *V.B.* **29**, 2455 & 2456] appears to belong to the vaccinia group of pox viruses, according to the lesions produced on chorio-allantoic membranes and the scarified skin of rabbits and the presence of elementary bodies. It did not form large inclusion bodies and was lethal to rabbits inoculated intracerebrally. It was passaged serially in rabbits by this route. Although its characteristics differ from those of cow pox virus, rabbits were protected against it by previous infection with cow pox virus.—M.G.G.

Anon. (1959). **Cattle disease outbreaks in North Island. Widespread quarantine and "standstill" controls.**—*N. Z. J. Agric.* **98**, 532-533. 116

Mucosal disease of cattle was diagnosed for the first time in New Zealand in March 1959. Six outbreaks are reported. In the first 3 outbreaks all cattle on the affected farms were destroyed, but in later outbreaks they were placed in strict quarantine in order that the disease could be studied.—M.G.G.

Gillespie, J. H., McEntee, K., Kendrick, J. W. & Wagner, W. C. (1959). **Comparison of infectious pustular vulvovaginitis virus with infectious bovine rhinotracheitis virus.**—*Cornell Vet.* **49**, 288-297. 117

Despite their dissimilarity clinically, the viruses of infectious pustular vulvovaginitis and infectious bovine rhinotracheitis produced

markedly similar features in tissue cultured bovine kidney cells. In cattle when each virus was inoculated vulvovaginally and intranasally they produced similar clinical and pathological features and each virus immunized against itself and the other. In reciprocal neutralization tests, serum from cattle recovered from either infection neutralized both viruses at similar titres. Although these two viruses appear to be one and the same, revision of the nomenclature should be postponed.—A. ACKROYD.

I. MacOwan, K. D. S. (1959). **Observations on the epizootiology of lumpy skin disease during the first year of its occurrence in Kenya.**—*Bull. epiz. Dis. Afr.* **7**, 7-20. [Summary in French.] 118

II. Burdin, M. L. (1959). **The use of histopathological examinations of skin material for the diagnosis of lumpy skin disease in Kenya.**—*Ibid.* 27-36. [Summary in French.] 119

III. Prydie, J. & Coackley, W. (1959). **Lumpy skin disease—tissue culture studies.**—*Ibid.* 37-50. [Summary in French.] 120

IV. Capstick, P. B. (1959). **Lumpy skin disease—experimental infection.**—*Ibid.* 51-62. [Summary in French.] 121

I. Spread of the disease in south-west Kenya during 1958 was traced with the aid of twelve maps. All active clinical cases were slaughtered and movement of stock was controlled. Observations on the disease were presented, including the simultaneous presence of large numbers of mosquitoes.

II. Skin from 31 outbreaks of the disease was examined. An account of the histology of lesions included nuclear changes similar to those seen in sheep pox and swine pox, but not previously described in lumpy skin disease. The appearance of all cases conformed with that of infection with "Neethling" type of virus [*V.B.* **29**, 392] in South Africa. The similarity to pox diseases is pointed out and notes on differential diagnosis are included.

III. Of the three groups of agents isolated from lumpy skin disease in South Africa, only "Neethling" and "orphan" viruses were isolated in Kenya; there were no isolations of "Allerton" type agents. The cytopathogenic properties of these agents and the range of susceptible cells are described. Viruses of the "Neethling" type resembled pox viruses in certain respects.

IV. C. described lesions in cattle associated with experimental infection with "Allerton", "Neethling" and "orphan" types of viruses, and the response of previously inocu-

lated cattle to challenge. The susceptibility of sheep and goats was studied. When inoculated i/d into cattle, a strain of virus isolated from sheep with a disease clinically and pathologically resembling sheep pox conferred immunity to i/d challenge with virus of the "Neethling" type.—R.M.

Capstick, P. B., Prydie, J., Coackley, W. & Burdin, M. L. (1959). **Protection of cattle against the "Neethling" type virus of lumpy skin disease.**—Vet. Rec. 71, 422-423. 122

In Kenya, only the Neethling type of virus has been found associated with lumpy skin disease. Lesions produced by it in cattle closely resemble those produced in sheep by sheep pox virus. Whilst immunization with a formolized tissue cultured Neethling type virus has so far proved ineffective in protecting animals against lumpy skin disease, two small-scale experiments have shown that the Kedong strain of sheep pox virus, injected i/d, s/c or i/m will protect cattle against intradermal challenge with virulent Neethling virus.

—A. ACKROYD.

Plowright, W., Witcomb, M. A. & Ferris, R. D. (1959). **[Studies with a strain of contagious pustular dermatitis virus in tissue culture.]**—Arch. ges. Virusforsch. 9, 214-231. [In English. Authors' summary modified.] 123

A description is given of the growth and cytopathogenicity of an English strain of contagious pustular dermatitis virus in monolayer cultures derived from lamb and calf testes and ovine, bovine and caprine embryonic kidneys. This strain behaved very similarly to other mammalian pox-like viruses [sheep pox, bovine papular stomatitis and lumpy skin disease of cattle]. The infection was disseminated more rapidly and completely in cultures of testis cells and peak titres were often slightly higher in this cell type. Some evidence suggested that adsorption of viral inocula to testis cells was more complete than to kidney cells.

Growth-curve studies in sheep kidney and testis cells are described in detail. The amount of virus demonstrable in the fluid was consistently less than that in attached cells throughout the phase of log. increase and for a considerable time thereafter.

Hörter, R. (1959). Die Hochvakuumgefrier-trocknung des Schafabortvirus unter Berücksichtigung verschiedener Schutzlösungen und Einfriermethoden. **[Freeze-drying of sheep abortion virus. Effect of different**

**protective media and methods of freezing.]**—Zbl. Bakt. I. (Orig.) 175, 356-362. [Summaries in English, French, Spanish and Russian. English summary modified.] 124

The protective action of the following media on freeze-dried sheep abortion virus was determined: sterile skim milk with 7.5% glucose, serum broth with 7.5% glucose, 0.85% saline, and distilled water. Skim milk with glucose proved to be especially suitable for quick freezing. The infectivity titre was little less than that of the virus suspension before drying. The infectivity was lost completely when saline was used. Virus suspensions dried with distilled water or serum broth showed infectivity only when undiluted.

Moulton, J. E. & Palmer, A. C. (1959). **Attempts to demonstrate the transmissible agent of scrapie in experimentally infected goats by means of fluorescent antibody.**—Cornell Vet. 49, 349-359. [Authors' summary.] 125

Fluorescent conjugates were prepared from sera of a goat affected with scrapie and of rabbits given multiple inoculations of cerebrospinal fluid from goats affected with the disease.

Efforts to demonstrate the transmissible agent of scrapie in the brains of experimentally infected goats by the fluorescent-antibody method were unsuccessful.

A review of the recent literature of scrapie is presented.

Anon. (1959). **When vaccination protection breaks down. Possible explanations of swine fever outbreaks.**—Vet. Rec. 71, 450. 126

In Gt. Britain outbreaks of swine fever for the last five years have varied between 741 and 1,455. Most have occurred in unvaccinated herds but in 1958, 14 occurred in herds vaccinated with crystal violet vaccine. In almost every case, the disease developed in young piglets, in 9 instances shortly after vaccination. Detailed investigation indicates that the outbreaks were not due either to the vaccine or to an atypical strain of virus, and infection had not been introduced accidentally by the veterinary surgeon. The most probable cause appears to be that piglets which had lost their maternally transferred immunity were already incubating the disease at the time of vaccination.—A. ACKROYD.

Entrenas, S. M. & De Gracia Mira, A. (1959). **Variación antigénica en el virus de la peste porcina. [Antigenic variation in swine fever**



virus.]—Proc. XVth Int. vet. Congr., Madrid 2, 465-466. [In Spanish.] 127

Serum and virus were produced in highly resistant and in highly susceptible pigs; they were designated "Cordova" and "Barcelona" respectively. In each case serum (0.5 ml./kg.) protected against the corresponding virus strain. "Cordova" serum protected against the "Barcelona" virus but "Barcelona" serum did not protect against "Cordova". Cross immunity was demonstrated in pigs immunized by the serum-virus simultaneous method. While the 2 virus strains were equally virulent the sera had different protecting properties attributable to different antigenic properties of the virus strains. In view of this antigenic variation, care is advocated in the selection of virus strain for the serum-virus method of immunization.—T.E.G.R.

Rubaj, B., (1959). Studia morfologiczne nadnerczy świń pomorowych. [**Morphology of adrenals in swine fever.**]—Ann. Univ. M. Curie-Skłodowska Sect. DD. 1957 12, 1-27. [In Polish. Summaries in English and Russian.] 128

R. examined adrenals of 40 pigs (20 infected experimentally with an American strain of swine fever virus, 10 field cases of swine fever and 10 normal controls) and found that in the course of swine fever the adrenal cortex undergoes marked structural changes characterized by hypertrophy of the cortex, broadening of the zona fasciculata and narrowing or atrophy of the remaining zones, megacytosis, the presence of a large number of light staining, active cells and swelling of the vascular endothelium and cells of the reticulo-endothelial system. These changes were more intensified in the experimental pigs than in the field cases. Marked perivascular cellular infiltrations, consisting mainly of lymphocytes and histiocytes, were noted in the medulla of 60% of field cases and 85% of experimental pigs.—M. GITTER.

Dale, C. N. & Songer, J. R. (1959). **In vitro propagation of hog cholera virus. II. Some biological and immunological characteristics of hog cholera virus grown in tissue culture. III. Cultivation of an immunological variant, with retention of its identifying characteristics.**—Amer. J. vet. Res. 20, 304-310 & 311-318. 129

Swine fever virus cultivated by the Maitland type system of tissue culture using minced pig spleen as substrate was highly virulent

after 30 passages, although in some cases a decreased pathogenicity was observed with the highest dilutions showing infectivity. Hyperimmune serum prepared by using cultured virus was somewhat less potent than commercially produced swine fever serum. No differences were detected when horse serum was substituted for pig serum in the tissue culture medium. Pigs treated simultaneously with cultured virus and hyperimmune serum prepared by its use were solidly immune when challenged with regular virus 9 months later. Of 12 vaccines prepared from cultured virus three showed some immunogenic value but in each case only one of two vaccinated pigs survived challenge with ordinary virus.

The immunological variant of virus which in 1949 killed pigs in the Midwest of the U.S.A. a few days after inoculation with virulent virus plus swine fever serum still retained its variant characteristics after 10 serial passages in tissue culture.—A. ACKROYD.

Matthias, D. & Klaus, H. (1959). Untersuchungen zur Pathogenese der Innenkörper in den Erythrozyten bei der Schweinepest. [**Pathogenesis of erythrocytic inclusions in swine fever.**]—Arch. exp. VetMed. 13, 157-170. 130

The number of inclusion bodies in blood from normal pigs and pigs with swine fever or swine influenza did not increase during incubation at 37°C. for 72 hours, nor in normal pigs' blood after the addition of diphtheria toxin, sulphanilamide, or serum containing swine fever virus. Phenylhydrazine, on the other hand, caused them to appear rapidly and in large numbers. Inclusion bodies increased *in vivo* in the blood of pigs given oral doses of sulphanilamide or sodium nitrate, or parenteral doses of phenylhydrazine or a sulphonamide preparation, but they differed morphologically according to causal substance and were distinguishable from those in pigs with swine fever. The methaemoglobin content of the blood did not increase in pigs infected with swine fever or vaccinated with crystal violet vaccine, but did in pigs given toxic doses of sulphanilamide and in one of 2 pigs inoculated with phenylhydrazine.—M.G.G.

Fuchs, F. (1959). Zur Frage der Impfschäden nach Anwendung von Kristall-Violett-Vakzine. [**Harmful effects of crystal violet vaccine.**]—Mh. VetMed. 14, 129-133. 131

The harmful effects that have been imputed to crystal violet vaccine are discussed.

They are respiratory and liver disorders, fatal syncope, pregnancy disorders, and abscesses. Reasons are given for rejecting the suggestions of Krüger [see *V.B.* 29, 1773] that the dye affects the reticulo-endothelial system and causes bronchopneumonia.—M.G.G.

Hecke, F. (1959). Ermittlung stumm mit dem Virus der ansteckenden Schweinelähmung (Teschener Krankheit) infizierter Tiere in Seuchengemeinden mittels der Serumneutralisation. [**Diagnosis of latent Teschen disease in pigs with the serum neutralization test.**]—*Mh. Tierheilk.* 11, 33-46. 132

Blood samples were obtained between December and May from 148 pigs in 92 herds. Teschen disease had been diagnosed in November in 5 herds of pigs in the vicinity. Positive or doubtful neutralizing titres were found in 46 pigs in 20 herds. Only one of these 46 pigs had clinical Teschen disease. In the other 19 herds the infection was latent.

—M.G.G.

Goodwin, R. F. W. & Jennings, A. R. (1959). **Infectious gastro-enteritis of pigs. II. Transmission and neutralization experiments.**—*J. comp. Path.* 69, 313-326. [Authors' conclusions modified.] 133

A highly infective form of gastro-enteritis in pigs was transmitted experimentally by direct and indirect contact. The disease was also reproduced with bacteria-free filtrates from the faeces of affected pigs.

Piglets were relatively resistant when dosed with infective suspensions but highly susceptible if they were denied colostrum beforehand.

A chronic form of enteritis was produced in which the most consistent finding was gross thickening of the ileum. This lesion closely resembled the condition previously described as Terminal Ileitis.

Up to four serial passages were made with the infective agent, which passed through gradocol membranes of A.P.D. 0.32  $\mu$  and appeared to be specifically neutralized by a serum (78) prepared in the U.S.A. against Transmissible Gastro-enteritis.

Cabasso, V. J., Kiser, K. H. & Stebbins, M. R. (1959). **Distemper and measles viruses. I. Lack of immunogenic crossing in dogs and chickens.**—*Proc. Soc. exp. Biol., N.Y.* 101, 227-230. [Authors' summary modified.] 134

Puppies, vaccinated against distemper or immunized and challenged with distemper virus, developed high levels of homologous

antibodies but failed to develop complement-fixing or serum neutralizing antibodies for measles virus (MV). Similarly, chickens hyperimmunized with distemper virus did not develop measles neutralizing antibodies, although distemper antibodies in appreciable amounts appeared in all 6 birds. Hyperimmunization of another group of chickens with MV was followed by no neutralizing distemper antibodies in any of 6, whereas 5 of 6 birds gave a substantial measles response.

Ikegami, T., Konishi, S. & Ochi, Y. (1959). [**Studies on infectious hepatitis of dogs. III. Properties of the virus in dog kidney tissue culture.**]—*Jap. J. vet. Sci.* 21, 33-38. [In Japanese. English summary modified.] 135

Two Japanese strains of virus were studied. The neutralization test in tissue culture proved to be the best method of diagnosis. Infective titre of cultures showed no increase 5-6 days after inoculation. Complement-fixing antigen was first detected 2 days after inoculation, when cell damage was first seen. The c.f. titre increased steadily until 6-7 days after inoculation it reached 1:16. The virus was killed by heating at 50°C. for 150 min. or 60° for 3-5 min. In tissue culture it remained alive until 26-29 days after inoculation. Virus remained infective for tissue culture after storage for a year frozen or 9 months at 4°. At room temp. the virus remained infective for 10-13 weeks.

Virus passaged between 41 and 44 times in tissue culture caused slight fever and leucopenia after i/p inj. into dogs and virus was found in many organs; viraemia appeared later.

Lyon, H. W., Christian, J. J. & Miller, C. W. (1959). **Cytomegalic inclusion disease of lacrimal glands in male laboratory rats.**—*Proc. Soc. exp. Biol., N.Y.* 101, 164-166. [Authors' summary modified.] 136

Cytomegalic inclusion disease of intra-orbital and exorbital lacrimal glands was observed in adult male rats from 8 laboratory colonies but not in females nor in wild Norway rats. Affected acinar cells showed characteristic eosinophilic intranuclear inclusion bodies and subsequent cytomegaly. Bizarre nuclear patterns simulated neoplastic morphology in late stages of the disease.

Gledhill, A. W. (1959). **The interference of mouse hepatitis virus with ectromelia in mice and a possible explanation of its mechanism.**



—Brit. J. exp. Path. 40, 291-300. [Author's summary modified.] 137

When newly weaned mice were inoculated i/p with mouse hepatitis virus (MHV) and with ectromelia 24 hours later, the lethal effect of the latter virus was much reduced. No evidence of cross neutralization between ectromelia and MHV immune sera was obtained. When MHV was inoculated 9 days before ectromelia or 24 hours after ectromelia the pathogenicity of ectromelia was reduced. The lowered pathogenicity of ectromelia for mice infected with MHV is classed as interference.

Serum from adult mice bled 3 or 4 days after infection with MHV, in which infectious virus particles had been inactivated by heat or removed by filtration, increased the survival time of mice infected with about 10LD<sub>50</sub> of ectromelia. The sparing effect is attributed to a substance which appears to raise the resistance of mice rather than to inactivate ectromelia. The production of this substance during at least 2 days by mice infected with MHV may explain the interference of MHV with ectromelia.

Gledhill, A. W. (1959). **Sparing effect of serum from mice treated with endotoxin upon certain murine virus diseases.**—Nature, Lond. 183, 185-186. 138

Serum was prepared from blood collected 2 hours after inoculation of *Salmonella typhimurium* endotoxin. More mice survived ectromelia, or combined infection with mouse hepatitis virus and *Eperythrozoon coccoides*, if they received i/p inj. of the prepared serum than mice which received normal serum or no serum at all.—R.M.

Liebenow, W. & Schmidt, D. (1959). Über die Isolierung infektiöser Ribonukleinsäure aus Gehirnen mit MM-Virus infizierter Mäuse. [Isolation of infectious ribonucleic acid from the brain of mice infected with M.M. virus.] —Arch. exp. VetMed. 13, 116-120. 139

Infective ribonucleic acid was recovered with phenol from the brain of mice infected with the M.M. virus, a virus of the encephalomyocarditis group isolated by Jungeblut & Dalldorf [see V.B. 14, 1012]. Infectivity was not due to the presence of virus.—M.G.G.

Greuel, E. (1959). Vergleichende Untersuchungen zur Diagnostik der atypischen Geflügelpest durch Virusisolierung auf der Chorioallantoismembran exembryonierter Eier und Eikulturen. [Diagnosis of Newcastle disease

by isolation of virus on the chorioallantoic membrane of de-embryonated eggs and in chick embryos.]—Tierärztl. Umsch. 14, 207-208. 140

Newcastle disease virus was demonstrated in 37 of 45 experimentally infected fowls by inoculation of brain suspension on to the chorioallantoic membrane of de-embryonated eggs, but was demonstrated in only 29 by inoculation of chick embryos. Diagnosis by means of de-embryonated eggs was also the more rapid method.—M.G.G.

Schang, L. C. (1958). Ensayos de inmunización con virus de laringo-traqueitis aviar aislado en el país. [Immunization of fowls with a strain of avian infectious laryngotracheitis virus isolated in Argentina.]—Rev. Med. vet., B. Aires 39, 109-112. 141

Chickens were inoculated by cloacal scarification with an avirulent strain of the virus. Local reactions were seen in most birds. Two of 20 birds reacted to intratracheal infection with virulent virus one month later, and one died. Immunization between the ages of 3 and 4 months is recommended.—M.G.G.

Reuss, U. (1959). Virusbiologische Untersuchungen bei der Entenhepatitis. [Virological research on duck hepatitis.] —Zbl. VetMed. 6, 209-248. [Summaries in English, French and Spanish.] 142

Duck hepatitis has occurred in North-west Germany since 1956, and causes serious losses in birds up to 3 weeks old. Details are given of incidence, pathogenesis, clin. picture and P.M. lesions. Neutralization tests showed the virus to be identical with that causing virus hepatitis in ducklings in the U.S.A. A strain underwent 54 serial passages in chick embryos, during which its virulence for ducklings decreased. The virus could not be transmitted to chicks and lab. animals. It is excreted in the faeces. Latently infected ducklings excreted it for up to 8 weeks after infection. Aerogenous transmission of the infection was demonstrated. The virus remained viable for 4 days at room temp. and 6 days at 4°C. Electron microscopy revealed a spherical form 20-40 mμ in diameter. The serum of birds that survived infection contained neutralizing antibodies. Ducklings given this serum had passive immunity against the disease, but 2 of 20 such passively immune birds did not withstand massive experimental infection, whereas all of 32 ducklings given hyperimmune serum were resistant.—M.G.G.

Staub, H. (1959). Über die Virushepatitis der Enten. 4. Mitteilung: Über die von Muttertieren auf ihre Küken übertragene Immunität gegen die Enten-Virus-Hepatitis. [**Virus hepatitis in ducks. IV. Maternal transmission of immunity.**]—Mh. Tierheilk. 11, 47-48. 143

Fourteen ducklings from ducks with latent hepatitis were all resistant to experimental infection at 5 or 15 days of age. Eleven of 14 control ducklings died. It is recommended that ducks in chronically infected flocks should be inoculated with virulent virus shortly before the laying period.—M.G.G.

Schoop, G., Staub, H. & Ergüney, K. (1959). Über die Virushepatitis der Enten. 5. Mitteilung: Versuche zur Adaptation des Virus an embryonierte Hühnereier. [**Virus hepatitis of ducks. V. Attempted adaptation of the virus to chick embryos.**]—Mh. Tierheilk. 11, 99-106. 144

Chicks a few hours to several days old could not be infected with duck hepatitis virus. It underwent up to 6 passages in chick embryos with decreasing infectivity and pathogenicity.—M.G.G.

Pollard, M. & Starr, T. J. (1959). **Propagation of duck hepatitis virus in tissue culture.**—Proc. Soc. exp. Biol., N.Y. 101, 521-524. [Authors' summary modified.] 145

Duck hepatitis virus survived storage for at least 21 days at 37°C. It survived treatment with di-ethyl ether and with fluorocarbon. The virus was passaged 25 times in tissue cultures prepared with chick embryo explants. It was not propagated in cultures of trypsinized chick embryo cells or in cell lines of mammalian origin.

Kuborina, L. N. (1959). [**Animal experiments with psittacosis vaccines.**]—Voprosy Virusologii 4, 284-288. [In Russian. Summary in English.] 146

Three vaccines were compared: live virus in 10% suspension of brain; virus inactivated by 1:10,000 formaldehyde; virus inactivated by adding 1:10,000 merthiolate and holding at 37°C. for 7 days. None protected mice from respiratory infection. Monkeys challenged by s/c inj. of live virus remained healthy and developed immunity. Merthiolate vaccine gave better results than formalized in monkeys and pigeons and was recommended for immunizing these animals and for obtaining immune serum.—R.M.

Newton, N. & Bevis, R. E. (1959). **Purification of animal viruses with Zn(OH)<sub>2</sub>.**—Virology 8, 344-351. [Authors' summary modified.] 147

A simple and rapid means for purification of three animal viruses is described. Vesicular stomatitis virus, vesicular exanthema virus, and infectious rhinotracheitis virus were all precipitated quantitatively with Zn(OH)<sub>2</sub>. The zinc hydroxide-virus complex was then dissociated by ethylene-diamine-tetra-acetic acid. About 90% of the non-specific nitrogen was eliminated by this method from crude vesicular stomatitis virus suspensions.

There appears to be a direct relationship between concentration of Zn(OH)<sub>2</sub> and the amount of vesicular stomatitis virus recovered. The virus was removed quantitatively by 0.05% Zn(OH)<sub>2</sub> from a preparation containing 10<sup>7</sup> plaque-forming units per ml.

A preparation of vesicular exanthema virus of high titre was obtained after precipitation by Zn(OH)<sub>2</sub> and subsequent high-speed centrifugation. An electron micrograph of the purified preparation revealed spherical particles 55 mμ in diameter. The ratio of these particles to plaque count was approx. 200:1. The observed sedimentation rate of about 140 Svedberg units is compatible with the size shown by electron microscopy.

Robson, D. S. & Baker, J. A. (1958). **Simplified standards for live virus vaccines.**—Proc. 62nd Ann. Meet. U.S. Livestock Sanit. Ass., Florida, 1958 pp. 43-52. [Authors' summary modified.] 148

Standards suggested for the control of live virus vaccines consist of (1) an initial determination of the lowest passage level for safety and the highest passage level for effectiveness; (2) a statistical demonstration that the efficacy of commercial doses of vaccine at the highest passage level exceeds 90%; (3) continued control of quality by (a) maintaining passage levels between the predetermined lowest safe level and highest effective level, (b) testing every lot of vaccine for virus content by laboratory assay methods, (c) annually repeating the statistical demonstration of efficacy, using field test animals.

The efficacy standards, in particular, are discussed in considerable detail and a statistical design for testing efficacy is described.

Drozдов, G. G. (1959). [**Studies on milk-borne diphasic fever in human beings. I. Isolation with properties of virus strains. II. Serology**



**and immunology.**]—Voprosy Virusologii 4, 204-208 & 424-429. [In Russian. Summary in English.] 149

Several strains of virus were isolated from affected human beings, goats' milk and *Ixodes ricinus* ticks. The filtrability, resistance and pathogenicity of the strains were identical. The virus could be passaged in mice and in chick embryos. It caused encephalitis similar to tick-borne encephalitis when inj. intracerebrally into mice or young goats. G.pigs and cotton rats were not susceptible. The virus was killed by boiling for 2-3 min. Further evidence that all the strains were of one virus was provided by c.f. and cross immunity tests. [See also *V.B.* 29, 3171.]—R.M.

See also *absts.* 85 (a virus interfering with the development of *Pl. lophurae*); 317 (symposium, immunity and virus infection).

## IMMUNITY

Turk, J. L. (1959). **The relationship between complement and antibodies of different animals in the immune-adherence phenomenon.**—*Immunology* 2, 127-136. [Author's summary modified.] 151

A comparison is made of the titres of complement from different animals when reacting with antisera from different species, in the immune-adherence phenomenon. A failure of reactions between rabbit antibody and horse and pig complement in immune haemolysis is overcome by the addition of ammonia-treated g.pig serum, this does not occur in immune-adherence. This may mean that a further heat-stable ammonia-sensitive co-factor is necessary for immune-adherence in addition to the four components of complement. This co-factor is inactivated by zymosan.

The behaviour of mouse complement in immune-adherence indicates a relative deficiency in C2 as in immune haemolysis.

Conglutinin is shown to inhibit immune-adherence irrespective of the species of complement used.

Leon, M. A. & Nördén, Å. (1959). **Kinetics of equine complement.**—*J. Immunol.* 83, 99-104. [Authors' summary modified.] 152

Equine complement reacts with sensitized sheep erythrocytes to form a complex that can be lysed with g.pig serum treated with ethylenediamine tetraacetic acid.

The complex is more labile than the corresponding human or g.pig complexes.

Kleczkowski, A. (1959). **An electrophoretic study of the mechanism of precipitin reac-**

Stulberg, C. S., Rightsel, W. A., Page, R. H. & Berman, L. (1959). **Virologic use of monkey kidney cells preserved by freezing.**—*Proc. Soc. exp. Biol., N.Y.* 101, 415-418. [Authors' summary modified.] 150

Cells of freshly trypsinized monkey kidney were preserved by slow freezing in 5% glycerol medium and storage at  $-75^{\circ}\text{C}$ . Cultures of thawed cells yielded monolayers that could be directly used for virological work. Plaque morphology due to various viruses and assays by tube titration or plaque counts were equivalent to those produced in unfrozen cells. Isolation of viruses from faeces or cerebrospinal fluid was made with equal facility in either type of culture.

**tions: variation in reversibility.**—*Immunology* 2, 97-103. [Author's summary modified.] 153

Antibodies to human serum albumin differ from one antiserum to another in the degree of firmness and reversibility of combination with the antigen. These differences are reflected in different behaviour during electrophoresis of soluble antigen-antibody compounds. Molecules of each kind of antibody also seem able to combine with the antigen in more than one way.

Springer, G. F., Horton, R. E. & Forbes, M. (1959). **Origin of anti-human blood group B agglutinins in White Leghorn chicks.**—*J. exp. Med.* 110, 221-244. [Authors' summary modified.] 154

While anti-human blood group B agglutinins are present in the majority of White Leghorn chicks by the age of 30 days, none were demonstrable in germ-free chicks up to the age of 60 days. Anti-B agglutinins in trace amounts were first found in germ-free chicks 66 days old and increased to an average titre of about 1:2 by 91 days of age. This titre amounts to about 10% of that found in ordinary chicks. The appearance of antibody in low titre is attributed to trace amounts of non-living antigenic contaminants penetrating the germ-free barrier.

The necessity of appropriate absorption in order to obtain well defined specificities was pointed out. Several means commonly used to differentiate between normal and immune antibodies were employed: none showed a difference between anti-B agglutinins from ordinary chicks and from germ-free chicks deliberately immunized with blood group B

active *E. coli* O<sub>86</sub> or with B active preparations from human meconium. The implications of these findings with regard to the origin of natural agglutinins are discussed. It is concluded that measurable anti-human blood group B agglutinins in White Leghorn chicks are acquired early in life and are not inherited.

The possibilities and limitations of germ-free technique for this kind of immunological research were discussed.

Hirsch, J. G. (1959). **Immunity to infectious diseases: a review of some concepts of Metchnikoff.** — Bact. Rev. 23, 48-60. [Author's conclusions modified.] 155

A consideration of concepts of immunity to infection held by Metchnikoff has provided a means for appraising this field from the broad and long-term points of view. It is astonishing to find how much was known about mechanisms of host resistance to bacteria in 1900, and, in many respects, how little fundamental knowledge has been added in the twentieth century.

Bacterial infectious disease has gradually undergone a change from epidemic to endemic type. The era of the great plagues is largely past, but endemic infection continues to be a source of much illness and death. Potentially pathogenic microbes are widespread among the population but in the vast majority of instances do not cause disease. This common state of infection without illness is converted into an infectious disease when host resistance mechanisms are upset, permitting invasive multiplication of the parasite. Thus the factor which determines whether or not disease occurs is frequently the state of host resistance rather than contact with the parasite. Resistance of the host to bacterial infection may be impaired by disease (diabetes, influenza, etc.), therapy (use of adrenal steroids), environmental factors (irradiation, malnutrition, stress), or in many instances for reasons unknown.

In order to deal with this problem effectively, additional knowledge is required, concerning over-all genetic and environmental factors which influence host resistance, and especially about the precise mechanical and biochemical mechanisms which operate to control infectious agents *in vivo*.

Dixon, F. J. & Weigle, W. O. (1959). **The nature of the immunologic inadequacy of neonatal rabbits. II. Antibody formation by neonatal splenic cells transferred to adult**

**recipients.** — J. exp. Med. 110, 139-146. [Authors' summary modified.] 156

Cells from neonatal rabbits were capable of producing considerable amounts of antibody after exposure to antigen *in vitro* and transfer to irradiated adult recipients. This suggests that the immunological inadequacy of these neonates is not dependent primarily upon the lack of cells capable of antibody formation.

Both neonatal lymphoid cells sensitized *in vitro* and adult lymphoid cells sensitized *in vivo* made much more antibody after transfer to X-irradiated adult recipients than to neonatal recipients. Possible reasons for the significance of these observations are pointed out in the discussion.

Smith, V. R. & Erwin, E. S. (1959). **Absorption of colostrum globulins introduced directly into the duodenum.**—J. Dairy Sci. 42, 364-365. 157

Increasing amounts of gamma globulin were found in the blood serum of 2 calves 4, 8 and 12 hours after the introduction of 1½ litres of colostrum into the duodenum at the age of 6 or 18 hours. Calves aged 48-60 hours did not absorb immune proteins. It is suggested that the inability of older calves to absorb immune proteins is due to impermeability of the intestinal wall and not to the development of digestive enzymes.—M.G.G.

Talmage, D. W. (1959). **Immunological specificity. Unique combinations of selected natural globulins provide an alternative to the classical concept.** — Science 129, 1643-1648. [Author's summary modified.] 158

The concept of immunological specificity based on a unique combination of natural globulins is an attractive alternative to the classical concept of unique globulin molecules for each possible antigen. Many facets of the antibody response such as antibody diversity, cross-reactions, natural antibodies, increased mitoses in lymphatic tissue, the anamnestic response and immune tolerance may be related through the thesis that antibody production is not a unique phenomenon but a specialized example of certain general cellular processes.

Joysey, V. C., Goodwin, R. F. W. & Coombs, R. R. A. (1959). **The blood groups of the pig. VII. The distribution of twelve red cell antigens in seven breeds.**—J. comp. Path. 69, 292-299. [Authors' conclusions modified.] 159

The distribution of the A antigen and 11 other red cell antigens was studied in Large



White, Landrace, Wessex, Essex, Large Black, Tamworth and Gloucester Old Spot pigs. The blood-group patterns of these breeds are dis-

cussed in relation to those antigens most probably concerned in haemolytic disease of the new-born.

See also absts. 12-13 (TB.); 17 & 19 (swine erysipelas); 28 (effect of B.C.G. on resistance to salmonellosis); 30-31 & 34 (salmonellosis); 36-44 (brucellosis); 48 (leptospirosis); 52 (tetanus); 54 (botulism); 64 (caprine pleuropneumonia); 75-76 (trypanosomiasis); 93-100 (F. & M. disease); 103-104 (rabies); 113 (interference phenomenon in virus encephalitis in mice treated with bact. endotoxins); 125 (scrapie); 126-131 (swine fever); 132 (Teschen disease); 133 (porcine infectious gastro-enteritis); 134 (distemper and measles); 137 (mouse hepatitis and ectromelia); 141 (avian infectious laryngotracheitis); 142-145 (virus hepatitis in ducks); 146 (psittacosis); 148 (virus vaccines); 178 & 180 (helminths); 317 (symposium, immunity and virus infection).

## PARASITES IN RELATION TO DISEASE [GENERAL]

Davis, L. R., Herlich, H. & Bowman, G. W. (1959). **Studies on experimental concurrent infections of dairy calves with coccidia and nematodes. II. *Eimeria* spp. and the medium stomach worm, *Ostertagia ostertagi*.**—Amer. J. vet. Res. 20, 487-491. 160

The combination of *Eimeria* species attacking the intestine, and *Ostertagia* species attacking the abomasum concurrently did not enhance the development of either parasite.

—B. M. WILSON.

## PARASITES IN RELATION TO DISEASE [ARTHROPODS]

Sherman, M. & Ross, E. (1959). **Toxicity to house fly larvae of insecticides administered as single oral dosages to chicks.**—J. econ. Ent. 52, 719-723. [Authors' summary modified.] 161

Faeces collected daily from chicks fed safe amounts of insecticides killed nearly all house-fly larvae for varying periods of time, as follows: malathion, 1 day; Dipterex, 2 days; Dow ET-14, 3 days; and Dow ET-15, 6 days. Faeces from chicks treated with diazinon and phenothiazine killed relatively few larvae.

Drummond, R. O. & Graham, O. H. (1959). **Dowco 109 as an animal systemic insecticide.**—J. econ. Ent. 52, 749-750. [Authors' summary modified.] 162

Because of its effectiveness in screening tests, Dowco 109 [*O*-(4-*tert*-butyl-2-chlorophenyl) *O*-methylmethylphosphoramidothioate] was used to treat small numbers of cattle. *Hypoderma bovis* and *H. lineatum* were controlled by treating cattle orally or intramuscularly with 15 to 25 mg./kg. or by spraying them with a 1% suspension. The control varied from 76 to 99%. None of the animals were poisoned by the insecticide.

Peterson, H. O., Cobbett, N. G. & Meleney, W. P. (1958). **Treatment of *Oestrus ovis* with dimethoate.**—Vet. Med. 54, 377-383. [Authors' summary modified.] 163

In six preliminary experiments, 72 adult sheep (principals and control) were used to determine an effective, non-toxic, and easily administered dose of dimethoate (*O,O'*-dimethyl *S*-alpha-mercapto-*N*-methylacet-

amidodithiophosphate). Oral doses ranged from approx. 5 to 100 mg./kg. Intramuscular doses, using a 50% injectable solution, ranged from 20 to 80 mg./kg. An i/m dose of 25 mg./kg. was determined to satisfy all the requirements.

In the final test, 31 of 60 ewes, naturally infested with larvae of *O. ovis*, were given a single i/m inj. of dimethoate as a 50% injectable soln. at 25 mg./kg. The remaining 29 sheep were controls. No toxic symptoms were observed in any of the sheep at this dosage level. 72 hours after treatment 98% of the first instars, 97% of the second instars, and 92% of the third instars were killed in the treated sheep. The treatment must be studied further before it can be regarded as safe for general use.

Kaplanis, J. N., Hopkins, D. E. & Treiber, G. H. (1959). **Dermal and oral treatments of cattle with phosphorus-32-labeled Co-Ral.**—J. agric. Food Chem. 7, 483-486. [Authors' summary modified.] 164

Only small amounts of phosphorus-32 were absorbed through the skin and eliminated in the urine after dermal application to cattle. High levels of the unchanged toxicant were found on the hair several weeks after treatment. The compound was ineffective as a systemic against stable flies and screw-worm larvae but highly effective against these insects by contact. After oral treatments, at 10 and 20 mg. per kg., approx. 38% of the dose was excreted in urine as polar degradation products and about 35% in the faeces 7 days after treatment.

Burns, E. C., McCraine, S. E. & Moody, D. W. (1959). **Ronnel and Co-Ral for horn fly control on cable type back rubbers.**—J. econ. Ent. 52, 648-650. [Authors' summary modified.] 165

Co-Ral [O-(3-chloro-4-methylumbelliferone) O,O-diethyl phosphorothioate or Bayer 21/199] at 0.25% and ronnel [Trolene or Dow ET-57] at 1% oil solution were tried as back-rubber formulations for horn fly (*Siphona irritans*) control. Both insecticides compared favourably with 5% toxaphene.

Roth, A. R. & Bigley, W. S. (1959). **Sheep keds control with organic phosphorus compounds.**—J. econ. Ent. 52, 539-540. 166

Lambs infested with an average of 3.7-27 keds per head were treated with insecticides power-sprayed at 250-300 lb./sq. in. In 1957 treatment with 1 quart per lamb showed 0.1-0.25% Korlan (Dow ET-57) about as effective as 0.25% malathion or 0.25-0.5% Bayer 21/199 (Co-Ral); all gave good to excellent control for at least 8 weeks. In 1958, 2 quarts of 0.1% spray per lamb gave 100% control for at least 6 weeks with Korlan, Bayer 21/199, Dowco 109, and Delnav (=Hercules AC-528 or 2,3-p-dioxanedithiol S,S-bis (O,O-diethyl phosphorodithioate)). Dicapthon gave 96-100% control, but stained the wool; malathion gave 79-100% control, Dipterex (Bayer L13/59, Neguvon) 83-85% and DDT 76-97% control.—W. N. BEESLEY.

O'Brien, R. D. & Wolfe, L. S. (1959). **The metabolism of Co-Ral (Bayer 21/199) by tissues of the house fly, cattle grub, ox, rat, and mouse.**—J. econ. Ent. 52, 692-695. [Authors' summary modified.] 167

In mammals the liver is primarily responsible for Co-Ral metabolism. In the mouse, which is susceptible to Co-Ral [O,O-diethyl O-(3-chloro-4-methylumbelliferone) phosphorothioate] the compound is activated, and there are no degrading systems. In the ox and rat, which are resistant to Co-Ral, the compound is degraded. It has been shown for the ox that both an activating and a degrading system are in the liver, but the latter is more potent. In house flies and warble fly larvae, which are susceptible to Co-Ral, there is an activating but no degrading system. Activation by warble fly larvae is associated with the fat body and gut. The results account for the

selective toxicity of the insecticide, and possibly for the fact that only dermal treatment kills warble fly larvae in the ox.

Robbins, W. E., Hopkins, T. L. & Darrow, D. I. (1959). **Synergistic action of piperonyl butoxide with Bayer 21/199 and its corresponding phosphate in mice.**—J. econ. Ent. 52, 660-663. [Authors' summary modified.] 168

The joint oral administration of piperonyl butoxide (1:5) increased the toxicity of both Bayer 21/199 [O-(3-chloro-4-methylumbelliferone) O,O-diethyl phosphorothioate] and its corresponding phosphate to mice four- to sixfold. This increase in toxicity was also found when synergist and toxicant were administered by different routes. Piperonyl butoxide increased the *in vivo* but not the *in vitro* inhibition of mouse brain cholinesterase by 21/199 or its phosphate. Preliminary studies with P<sup>32</sup>-labelled 21/199 demonstrated that the joint administration of piperonyl butoxide inhibited its metabolism.

Overås, J. (1959). Tick-Borne Fever (sjodogg) som årsak til abort hos sau. [**Tick-borne fever as the cause of abortion in ewes.**]—Nord. VetMed. 11, 475-482. [In Norwegian. Summaries in English and German. English summary modified.] 169

A spontaneous outbreak is reported of tick-borne fever ("sjodogg") occurring over January-February, with abortion in a ewe 11 weeks pregnant. Blood from this animal was used to inoculate 3 ewes assumed to be pregnant: all 3 developed fever. One aborted 10 days after the s/c inj. The 2nd ewe lambed 2 lambs at the normal time one of which was dead and not fully developed. The 3rd ewe was barren at the expected time of delivery.

Adverse effects of oxytetracycline therapy on the development of a reliable immunity are pointed out.

Alwar, V. S., Lalitha, C. M. & Acuthan, H. N. (1959). **Railletia auris (Leidy, 1872) Trouessart, 1902 in the ears of cattle (Bos indicus) in Madras.**—Indian vet. J. 36, 276-280. [Authors' summary modified.] 170

*R. auris*, the cattle ear mite, is recorded from a bull in Madras associated with otorrhoea. A detailed description of the mite is given. Its zoological classification is discussed.



## PARASITES IN RELATION TO DISEASE [HELMINTHS]

- Del Bono, G. & Pellegrini, N. (1959). Enzootia nel coniglio ra *Distomum hepaticum* Linné, 1758. [An outbreak of fascioliasis in rabbits.]—*Zooprofilassi* 14, 379-391. [Summaries in English and French.] 171  
Faeces samples from 66 domestic rabbits revealed *Fasciola hepatica* infestation in 51 of which 2 died. The clinical symptoms, P.M. findings and microscopic changes are described. —T.E.G.R.
- Ollerenshaw, C. B. & Rowlands, W. T. (1959). A method of forecasting the incidence of fascioliasis in Anglesey.—*Vet. Rec.* 71, 591-598. [Author's summary modified.] 172  
A relationship between the incidence of acute fascioliasis and climate in Anglesey has been established. The incidence of the disease has been assessed from data obtained at the Veterinary Investigation Centre in Bangor; data on climate from relevant meteorological records. Whilst neither the method of estimating the incidence of the disease, nor that of assessing the effect of climate on the development of the parasite is regarded as infallible, it is considered that there is sufficient correlation between the two over the 10-year period 1948-57 to enable reliable forecasting of the incidence of the disease. This would be of use in improving the current measures for disease control.
- Veselova, T. P. & Velikovskaya, Y. A. (1959). [Parenteral carbon tetrachloride therapy in bovine fascioliasis.]—*Veterinariya*, Moscow 36, No. 7 pp. 39-41. [In Russian.] 173  
A dose of 20 ml. of carbon tetrachloride was injected i/m, in an equal quantity of vaseline oil, into 351 cows with fascioliasis. Faecal examination in the following 2 weeks revealed that 85% were cured. The dose was well tolerated and milk yield rose.—M.G.G.
- Kendall, S. B. & Parfitt, J. W. (1959). Studies on the susceptibility of some species of *Lymnaea* to infection with *Fasciola gigantica* and *F. hepatica*.—*Ann. Trop. Med. Parasit.* 53, 220-227. [Authors' summary modified.] 174  
Under laboratory conditions, *Fasciola gigantica* collected in Pakistan was able to infect species of *Limnaea* both from Pakistan and from East and West Africa. Morphologically similar African flukes were fully infective to African snails but only to a limited extent to Pakistan snails.
- Robinson, E. J., Jr. (1959). Recovery of *Schistosoma mansoni* from hormonally imbalanced hosts.—*Exp. Parasit.* 8, 236-243. [Author's summary modified.] 175  
Male mouse hosts of *Schistosoma mansoni* were castrated, injected with testosterone, or subjected to these treatments simultaneously, and the survival rates of the worms compared to those of controls.  
Certain effects of the treatments are described, but they were not consistently obtained, and differed from others reported.  
It is concluded that the survival rates of schistosomes can be changed by disturbing the hormonal balance of the hosts, but that all the conditions required for a predictable change are not known.
- Dissanaike, A. S. (1958). On hydatid infection in a Ceylon Toque monkey *Macaca sinica*.—*Ceylon vet. J.* 6, 33-35. 176  
Three fertile hydatid cysts were found in the liver of a female *Macaca sinica*. D. postulates a sylvatic cycle of development of *Echinococcus granulosus*. The host of the adult may have been a wild carnivore such as the jackal.—R. N. FIENNES.
- Schoop, G. & Lamina, J. (1959). Über die vermizide Wirkung von Neguvon auf *Trichinella spiralis* in experimentell infizierten Mäusen. Vorläufige Mitteilung. [Anthelmintic action of "Neguvon" on experimental trichinosis in mice.]—*Mh. Tierheilk.* 11, 167-171. 177  
Mice were freed from trichinella when given "Neguvon" (Dipterex) by oral, intravenous or intra-abdominal routes. Treatment began on the first day after infection.—M.G.G.
- Turner, J. H. (1959). Experimental strongyloidiasis in sheep and goats. III. An attempt to induce passive immunity in lambs; changes in serum proteins after infection; and effect of immune serum on infective larvae.—*Proc. helm. Soc. Wash.* 26, 114-124. [Author's summary modified.] 178  
Attempts passively to transfer immunity to strongyloidiasis to four lambs by single injections of immune serum were unsuccessful.  
Determinations of total serum protein, albumin and globulins indicated that at least two antibodies were probably produced in response to infection with *Strongyloides papillosus*. Beta and gamma globulins increased during infection. The highest con-

centration of beta globulin appeared 3 weeks after infection and subsequently decreased, whereas the gamma globulin increased gradually, reaching maximum 6 weeks after infection. It was postulated that "beta antibody" played a more important role in the medial stage (3 to 4 weeks) of infection than "gamma antibody", but that both probably acted synergically during the terminal stage. It was suggested that acquired resistance to *S. papillosus* in lambs was localized mainly in the small intestine although antibodies developed in the blood after the parasites reached the intestine.

Oral and anal precipitates formed about the larvae within 4 hours after contact with immune serum. After 22 hours' exposure the larvae appeared to be dead, whereas larvae exposed to physiological saline solution and normal serum for a similar period were alive and motile.

Herlich, H. (1959). **Experimental infections of cattle with the stomach worms, *Ostertagia ostertagia* and *Trichostrongylus axei*.**—Proc. helm. Soc. Wash. 26, 97-102. [Author's summary modified.] 179

A combination of these species was much more detrimental to calves than either species alone. This was apparently due to a greater percentage of the infective larvae of both species becoming established and subsequently developing into adult worms in the host.

Weber, T. B. & Lucker, J. T. (1959). **Immunity against the cattle lungworm: resistance resulting from initial infection with small numbers of larvae.**—Proc. helm. Soc. Wash. 26, 132-137. [Authors' summary modified.] 180

Four calves were each given 500 larvae of *Dictyocaulus viviparus* and two 1,500. Each calf was exposed again to infection about 2½ to 3 months after the end of the patent period of the initial infection, with 25,000 infective larvae. Four other control calves not previously exposed to this lungworm were also given 25,000 larvae. Five of the six previously infected calves had a strong resistance though not complete immunity. The immunizing infections did not materially affect growth but did cause slight or moderate respiratory distress. After the challenge dose of larvae the resistant calves gained weight faster than the controls; resistance usually did not prevent respiratory distress but minimized it.

Barke, A. (1959). **Zur Verträglichkeit des Cyanacethydrazid als Lungenwurmmittel. [Toxicity of cyanacethydrazide.]—Tierärztl. Umsch.** 14, 268-271. 181

The LD<sub>50</sub> for mice, 10 g. in weight, of cyanacethydrazide in a freshly prepared aq. soln. was 2.6 mg. s/c and 2.3 mg. i/v. A four months old soln. that had turned brown was only half as toxic. The lethal dose for cats was about 75 mg./kg. body wt. s/c and for dogs 57-70 mg./kg. i/v. No toxic symptoms appeared in young pigs given up to 50 mg./kg. s/c. Animals given successive doses developed a certain tolerance shown by the disappearance of convulsions caused by the drug.—M.G.G.

Schwartz, B. (1959). **Experimental infection of pigs with *Ascaris suum*.**—Amer. J. vet. Res. 20, 7-13. 182

Patent infections of *Ascaris suum* were produced in 8 of 9 young pigs, either by the introduction of large numbers of eggs directly into the stomach by stomach tube, or by feeding them with the lungs of g.pigs which had been infected one week earlier.

Approximately 4 weeks after infection, immature worms were voided in the faeces. Elimination of worms continued over a prolonged period, the size of the worms increasing with age. At P.M. examination only relatively small numbers of worms were present in the intestines.

The natural elimination of the worms appeared to be associated with their final moult, and possibly with a resistance mechanism stimulated by the penetration of larvae into various tissues during their migrations.

As a result of their migrations in the host's body, larvae reach tissues in which development cannot proceed, so that the migrations of the larvae are of no survival value for the species. It is suggested that they are of phylogenetic significance, indicating the evolution of *A. suum* from ancestral forms having an indirect life-cycle.—J. ROSE.

Shelton, G. C., Magner, J. M. & Santmyer, P. H. (1959). **Sodium pentachlorophenate as an ovicide for controlling ascaris in swine.**—J. Amer. vet. med. Ass. 135, 229-233. [Authors' summary modified.] 183

The efficiency of sodium pentachlorophenate in destroying the eggs of pig ascarids was studied by controlled critical experiments using susceptible young pigs on plots heavily contaminated with ascarid eggs.



In two tests a single application (12 oz. per 100 sq. ft.) was made to the soil. In all pigs on the treated plots liver scars were reduced between 50 and 70%. Few ascarids were found in the intestines of any of the pigs. There was no correlation between liver scarring and the few immature ascarids that were present. It is postulated that the absence of ascarids in the intestines can be attributed to the milk diet or to an immunity acquired early, or to both.

A third test conducted in the summer of 1958 in an attempt to demonstrate that increased gains and feed efficiency would result from chemical destruction of ascarid eggs failed to confirm the results of the first two tests. The authors suggested a possible explanation for this discrepancy.

Terhaar, C. J., Hansen, M. F., Hein, R. E. & McFarland, R. H. (1959). Anthelmintic studies with carbon 14-labeled carbon tetrachloride on *Ascaridia galli* (Nematoda) and its chicken host. — Amer. J. vet. Res. 20, 662-664. [Authors' summary modified.] 184

Carbon tetrachloride labelled with  $C^{14}$  was administered to a chicken harbouring *A. galli*. Subsequent analyses revealed  $C^{14}$  in the tissues and excreta of the host as well as in the worms. In the host, the greatest uptake of  $C^{14}$  was in the caeca and the least in the testes. Carbon-14 appeared in the excreta 15 min. after treatment. The average uptake by the worms was much greater than that of any of the tissues of the host.

Jiřina, K. (1959). Über das Vorkommen der Setarien bei Pferden. [Incidence of *Setaria* in horses.]—Dtsch. tierärztl. Wschr. 66, 439-441. [Summary in English.] 185

*S. equina* was found in 865 (36%) of 2,407 slaughtered horses from Bohemia, Moravia, Slovakia, Bulgaria and Roumania.

Infestations were heavier and more frequent in poorly nourished animals. Many had signs of recent peritonitis. A setaria was also found in one of 114 cattle.—M.G.G.

Dimić, J., Šibalić, S. & Tadić, M. (1959). Periodische Augenentzündung und Augenfilariose der Pferde. [Periodic ophthalmia and filariasis in horses.] — Wien. tierärztl. Mschr. 46, 374-380. [Summaries in English, French and Italian.] 186

The eyes of 183 horses were obtained. *Onchocerca cervicalis* microfilariae were found in the cornea of 70 of 124 eyes with periodic ophthalmia and in 120 of 242 unaffected eyes. It is concluded that filariasis does not play a primary role in the aetiology of periodic ophthalmia.—M.G.G.

Ershov, V. S., Demidov, N. V. & Sakatunov, S. V. (1959). [Prevention of helminth infestation in cattle by continuous feeding of phenothiazine in small doses.]—Veterinariya, Moscow 36, No. 8. pp. 25-27. [In Russian.] 187

Phenothiazine was fed daily to 28 cattle from May to December. Cows received 3 g., heifers 2 g. and calves 1.5 g. The faecal incidence of fasciola and strongyle ova was only slightly less than in 28 untreated cattle. Weight gain, however, was on the average 44 kg. in treated animals compared with 26 kg. in controls. Treated animals yielded 26,348 kg. of milk, and controls 22,210 kg.—M.G.G.

Euzéby, J. & Bussiéras, J. (1959). Les perturbations métaboliques d'origine vermineuse. [Metabolic disorders caused by helminths.]—Cah. Méd. vét. 28, 117-135. 188

Helminth parasites adversely affect the absorption and utilization of proteins, glucides, minerals and vitamins, and upset the general metabolism of the host by causing diarrhoea, anaemia and liver disorders, and by forming toxins.—M.G.G.

See also absts. 160 (exp. concurrent infection in calves with coccidia and helminths); 321 (hook, tapeworms).

## SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Sastry, G. A. (1959). Neoplasms of animals in India. An account of neoplasms collected in 12 years. — Vet. Med. 54, 428-430. [Author's summary modified.] 189

An account of neoplasms collected over 12 years at the Madras Veterinary College, India,

from dogs, horses, donkeys, goats, sheep, and cats is presented. In mammals, other than dogs, the neoplasms of the epithelial tissues were most frequent. In dogs, the venereal tumour was more frequent. Unfortunately, the breed incidence of tumours in dogs could not be given in detail.

Christensen, E. A. & Kjems, E. (1959). **Infection and malignant tumours. II. Inhibition of growth of Brown-Pearce carcinoma in young rabbits treated with phage lysates of haemolytic streptococci.**—Acta Path. microbiol. scand. 46, 296-304. [In English. Authors' summary modified.] 190

Young rabbits with Brown-Pearce carcinoma were treated with three different lysates of haemolytic streptococci Group A, Type 12, produced by two streptococcal phages. In the lysates there were no viable bacteria. All three lysates inhibited growth of tumours in a large number of the rabbits. In all cases the inhibitory dose was close to the toxic dose.

Kassel, R., Burton, L., Friedman, F. & Rottino, A. (1959). **Carcinogenic action of refined tumor factor isolated from mouse leukemia tissue.**—Proc. Soc. exp. Biol., N.Y. 101, 201-204. [Authors' summary modified.] 191

A procedure has been developed for extracting and refining tumour factor contained in mouse leukaemia tissue. The extract repeatedly induced neoplasms in a high percentage of inoculated animals, but no leukaemia was induced. Results were reproducible and time of tumour appearance predictable. Tumours developed at an earlier age than when crude cell-free filtrates are used. Using this technique, tumour factor has been isolated from Hodgkin's disease tissue and other neoplastic tissues from man. It is suggested that the technique be applied to avian lymphoma and other animal tumours.

Lieberman, M. & Kaplan, H. S. (1959). **Leukemogenic activity of filtrates from radiation-induced lymphoid tumors of mice.**—Science 130, 387-388. [Authors' summary modified.] 192

Cell-free filtrates of X-ray-induced lymphoid tumours of strain C57BL/Ka mice have elicited, on injection into new-born isologous hosts, a lymphoma incidence of 15 to 19%. In control mice of the same subline, the incidence of spontaneous lymphoma was about 1%.

Rigdon, R. H. (1959). **Cataracts in chickens with lymphomatosis.**—Amer. J. vet. Res. 20, 647-654. [Author's summary modified.] 193

Ocular lesions occur in chickens infected with the virus of lymphomatosis; however, degeneration of the lens with typical cataract has not apparently been considered as characteristic of this infection.

The lesion in the lens is characterized by either focal or diffuse degeneration without inflammatory reaction. The lens fibres apparently undergo coagulation necrosis, followed by cyst formation. Epithelial cells and fibroblasts in the lens capsule may proliferate in focal areas and project into the degenerated areas of the lens. The retina may become detached and osteoid tissue may develop within the posterior chamber in old lesions.

The virus may enter the lens from contaminated fluid in the anterior chamber. Chickens showing this lens lesion usually have an associated iritis. Some of the birds also have lesions of visceral and neural lymphomatosis.

## NUTRITIONAL AND METABOLIC DISORDERS

Eadie, J. M., Hobson, P. N. & Mann, S. O. (1959). **A relationship between some bacteria, protozoa and diet in early weaned calves.**—Nature, Lond. 183, 624-625. 194

The effects of diet on rumen protozoa and bacteria were investigated. Two calves were inoculated weekly after 8 days with a suspension of rumen ciliates and bacteria. Calf A was fed wholly on concentrates and B on 3:1 mixture of dried grass and concentrate. Examination of samples withdrawn weekly suggested that *Veillonella gazogenes* is unaffected by diet, whereas *Lactobacillus* and a large Gram-negative lactate-utilizing coccus increase with increase in concentrates. Ciliates were present in B throughout but only appeared in A after 12 weeks, suggesting that

the number is in inverse relationship to the number of *Lactobacillus* as is the case with a number of other Gram-negative bacteria.

—BRENDA M. WILSON.

Diaz, F., Speer, V. C., Homeyer, P. G., Hays, V. W. & Catron, D. V. (1959). **Comparative performances of baby pigs fed infant and baby pig diets.**—J. Nutr. 68, 131-140. [Authors' summary modified.] 195

Two experiments involving 136 pigs were conducted to compare the value of human infant milk formulas and baby pig diets as measured by rate of gain and feed conversion.

The one- to 5-week gains and feed conversion were quite satisfactory for piglets receiving formulas containing milk as the



source of protein when the protein levels were approx. 2.7 to 3.4% of the liquid diet (20 Cal. per fluid ounce). The feeding of formulas containing 1.7 and 1.6% protein and 3.4 and 3.5% fat, respectively, resulted in less rapid growth and required more dry matter per lb. of gain as compared to the baby pig diets or the infant formulas containing 2.7% protein and 2.8% fat. The feeding of formulas containing soya protein at 3.2 and 3.1% resulted in lowered rate of gains and increased feed required per lb. of gain, which is a reflection of the baby pig's inability adequately to utilize soya protein.

Brownlee, A. & Moss, W. (1959). **Changes in size of the gastro-intestinal tract, liver and kidneys of the laboratory rat at different live weights and on different dietary regimens.**—Brit. vet. J. 115, 225-234. [Authors' summary modified.] 196

The weight of the liver, kidneys, and gastro-intestinal tract of lab. rats per 100 g. live weight (except for breeding females) falls with increasing live weight. A similar fall occurs in the amount of food consumed per 100 g. live weight. In breeding females the liver and gastro-intestinal tract increase in weight and food consumption increases.

In rats reared on a flesh diet the large intestine is shorter and lighter than in rats reared on a mash diet.

In rats allowed to feed only once a day for 2½ hours the stomach is heavier than in rats fed *ad libitum*.

Increased or decreased size in one part of the gastro-intestinal tract does not necessarily involve the other parts of the tract in the same type of change.

In a closed-population stock considerable variation in organ size may occur in rats of the same live weight and under the same environmental conditions.

The lab. rat feeds predominantly, but not exclusively, during evening and night hours but it changes to diurnal feeding readily if food is available only during day-time. The longest observed period of voluntary abstinence from food was nine hours. In most rats this period was much shorter.

The analogy is drawn between the relative increase in organ size plus increased food consumption in young rats and the increased metabolic rate in the younger ages in man.

Pope, G. S. & McNaughton, M. J. (1959). **Oestrogens in British pasture plants.**—J.

Dairy Res. 26, 196-202. [Authors' summary modified.] 197

Four species of *Medicago*, 6 species of *Trifolium* and 14 grass species, all common in British pastures, were tested for oestrogenic activity by the mouse uterine weight method. Activity was detected in 4, 4 and 6 species respectively. It is probable that the quantity of oestrogen in British pasture plants is insufficient to affect milk composition in cows at pasture.

Bauer, F. & Becker, W. (1959). Die prophylaktische Anwendung von Myofer bei der Anaemie der Saugferkel. [Iron-dextran complex for prophylaxis of piglet anaemia.]—Tierärztl. Umsch. 14, 88-91. 198

In trials with 200 piglets, those inoculated i/m with iron-dextran complex containing 100 or 150 mg. Fe on the second day of life gained about 20% more weight in the next 4 weeks than controls and the haemoglobin content of their blood did not fall, as it did in controls.

—M.G.G.

Vallee, B. L. (1959). **Biochemistry, physiology and pathology of zinc.**—Physiol. Rev. 39, 443-490. 199

A review of the part played by zinc in the body and the results of deficiency or excess [359 references].—R.M.

Mayo, R. H., Plumlee, M. P. & Beeson, W. M. (1959). **Magnesium requirement of the pig.**—J. Anim. Sci. 18, 264-274. [Authors' summary modified.] 200

A deficiency of dietary magnesium results in the following symptoms in order of appearance: weak front pasterns, sickled hocks, a concave bowing back of the front legs due to extreme pastern weakness, knock-knees and hocks, hyperirritability, muscular twitching, arched back, reluctance to stand and a continual shifting of the feet while standing, followed by tetany and death.

The above symptoms were accompanied by reductions in growth rate, feed consumption, feed conversion and serum magnesium.

The amount of dietary magnesium required to prevent deficiency symptoms was greater than the amount necessary for optimum growth. The magnesium requirement of pigs weaned at either 3 or 9 weeks of age is between 400 and 500 p.p.m. of the total ration.

Emerick, R. J., Embry, L. B. & Olson, O. E. (1959). **Effect of sodium silicate on the**

**development of urinary calculi and the excretion of various urinary constituents in sheep.**—*J. Anim. Sci.* 18, 1025-1030. 201

Twelve lambs were fed for 115 days on a ration of oats and hay containing 2.96% silica, and 12 on a ration of oats and lucerne containing 0.84% silica. Sodium silicate was added to the rations of 6 lambs in each group, raising the silica content to 3.34% and 1.21% respectively. Urinary calculi developed in 3 lambs in the first group, but in none in the second group. Silica was the main constituent of a stone from a lamb on the 2.96% silica diet, but a stone from a lamb on the 3.34% silica diet consisted mainly of calcium and magnesium phosphates. Sodium silicate reduced the urinary excretion of calcium in the group fed hay and that of magnesium in both groups. The urinary excretion of phosphorus was 125 mg. daily in the 3 sheep that developed calculi compared with 19 mg. in the other 9 sheep on the same rations, and the respective phosphorus content of the plasma was 9.72 and 7.81 mg.%. It is concluded that variations in phosphorus metabolism may be important in the development of urinary calculi.—M.G.G.

Pullar, E. M. (1959). **Mineral deficiencies in pigs. I. Natural cases in Victoria.**—*Aust. vet. J.* 35, 203-209. [Author's summary modified.] 202

P. described the incidence, importance and aetiology of mineral deficiencies in pigs in Victoria. Rickets in young pigs is common, and appears to be mainly due to low calcium intake, less frequently to low phosphorus intake, incorrect calcium/phosphorus ratio and low vitamin D. The possible influence on the occurrence of rickets of the method of administration of the calcium supplement is discussed. Osteomalacia in adult pigs is comparatively rare. Nutritional anaemia is far more common than is generally realized. The Tallqvist haemoglobin scale is a valuable diagnostic aid for field and laboratory use. Access to soil is not reliable for prophylaxis. Reduced iron has given extremely good results for both prophylaxis and treatment. The possible occurrence of nutritional abortions and stillbirths is discussed. Goitre is extremely rare in Victorian pigs. No definite cases of copper deficiency have been detected. Parakeratosis has not been reported in Victoria.

Wilkie, W. J. (1959). **Mineral deficiencies in pigs.**—*Aust. vet. J.* 35, 209-216. 203  
Known mineral deficiencies in pigs, and

occurrences in South Australia are recorded. An attempt is being made to formulate a ration, compounded from readily available feeding stuffs, which will produce maximum growth rate from weaning to bacon weight on a minimum food intake.—A. G. CULEY.

- I. Frape, D. L., Allen, R. S., Speer, V. C., Hays, V. W. & Catron, D. V. (1959). **Relationship of vitamin A to S<sup>35</sup> metabolism in the baby pig.**—*J. Nutr.* 68, 189-201. 204
- II. Frape, D. L., Speer, V. C., Hays, V. W. & Catron, D. V. (1959). **Thyroid function in the young pig and its relationship with vitamin A.**—*Ibid.* 333-341. [Authors' summaries modified.] 205

I. Maximum accumulation of radio-sulphur in blood and lung occurred within 9 hours of i/p inj. of labelled sodium sulphate; about 17 hours were required for maxima in ear cartilage and costochondral junctions in the ribs. Pigs maintained on various amounts of vitamin A were killed 17 hours after i/p inj. of labelled sulphate. Extreme deficiency in vitamin A caused high conc. of S in all tissues especially the costochondral junction. Addition of vitamin A to the diet considerably reduced this concentration, minimum radioactivity occurring at 790 i.u. of vitamin per lb. of feed. Higher concentrations of vitamin (up to 11,400 i.u. per lb. of feed) brought about some return to higher specific radioactivity.

II. Insufficient and excessive intakes of vitamin A lowered the rate of thyroxine secretion. Since the relationship between secretion rate and growth rate in the pig is rather small, a more direct effect of vitamin A upon thyroid function was postulated.

Dutt, B. (1959). **Effect of vitamin A deficiency on the testes of rams.**—*Brit. vet. J.* 115, 236-238. [Author's summary modified.] 206

Young rams born to dams kept on a diet deficient in vitamin A were put on experimental diet which contained only traces of vitamin A. After a month, symptoms of vitamin A deficiency began to appear. There was considerable atrophy of the testes; their weight was one-seventh to one-tenth of that of the testicles of normal ram. Libido was very low and continued to decline until, after ten months on the carotene deficient diet, little or no sexual interest could be aroused. The seminiferous tubules showed degenerative changes on histopathological examination. The diameter of the tubules was reduced considerably and most of the tubules were lined by a



single layer of cells; the lumen was full of structureless necrotic material and there was no sign of spermatogenesis.

Nisbet, D. I., Butler, E. J. & Macintyre, I. J. (1959). **Muscular dystrophy in experimental lambs.** — J. comp. Path. 69, 339-352. [Authors' conclusions modified.] 207

Muscular dystrophy occurred in lambs born to housed ewes fed on hay and oats with a low copper content. Clinical symptoms were not apparent. The lesions were predominantly myocardial, and in some cases associated with hypochromic anaemia. Pneumatosis of the abomasum and small intestine was observed in a few lambs. The condition did not recur in lambs born to the same ewes the following year after the addition of a vitamin E supplement to the diet.

Sharman, G. A. M., Blaxter, K. L. & Wilson, R. S. (1959). **Prevention of enzootic muscular dystrophy by selenium administration.** — Vet. Rec. 71, 536. 208

In 58 groups each of 3 calves, one calf received 200 mg. alpha-tocopherol weekly, one received 0.25 mg. selenium daily and one was the control. Muscular dystrophy developed in 10 of the 58 controls, in 2 (mild cases) of the 58 calves fed alpha-tocopherol but in none of those fed selenium. It is suggested that a diet containing adequate tocopherol may mask selenium deficiency.—M.G.G.

Nesheim, M. C., Leonard, S. L. & Scott, M. L. (1959). **Alterations in some biochemical constituents of skeletal muscle of vitamin E-deficient chicks.** — J. Nutr. 68, 359-369. [Authors' summary modified.] 209

Chicks were fed two different muscular dystrophy-producing diets, with and without vitamin E, and glycogen, phosphorylase, dry matter, ash, sodium, potassium and creatine were determined in breast and leg muscles after 4 to 5 weeks.

Body weights were nearly the same and the birds showed no outward manifestation of muscle dystrophy.

Active phosphorylase and total phosphorylase concentration both were lower in white muscle of the deficient chick but no consistent changes were detected in red muscle.

Glycogen content was lower in white dystrophic muscles in comparison with the controls but no difference was observed between the normal and dystrophic red muscle. White muscle is basically richer in glycogen than red muscle.

Both diets gave essentially the same results and 5 weeks is a preferred period for these changes to develop.

Da Silva, A. C., Fajer, A. B., De Angelis, R. C., Aparecida Pontes, M., Giesbrecht, A. M. & Fried, R. (1959). **The domestic cat as a laboratory animal for experimental nutrition studies. VII. Pyridoxine deficiency.** — J. Nutr. 68, 213-229. [Authors' summary modified.] 210

Pyridoxine deficiency was obtained in growing cats. The signs observed were growth depression, microcytic hypochromic anaemia with high serum iron, convulsive seizures and kidney lesions, represented by areas of tubular atrophy and tubular dilatation, fibrosis and intratubular deposition of birefringent crystalline material. The pyridoxine content of tissues was about half of control values. Xanthurenic acid excretion was very low. Blood and plasma volume, total body water, blood glucose, pyruvic and lactic acid, plasma potassium, sodium, calcium and inorganic phosphorus were not affected. Satisfactory body weight and haematological recovery was obtained with pyridoxine treatment but the kidney lesions were not reversible.

Morrison, A. B. & Sarett, H. P. (1959). **The effects of deficiency of B vitamins on salt toxicity in the rat.** — J. Nutr. 68, 231-242. 211

Rats deficient in B vitamins were more susceptible to the toxic action of 3 or 6% sodium chloride in the diet than normal rats. —R.M.

Newberne, P. M. & O'Dell, B. L. (1959). **Pathology of vitamin B<sub>12</sub> deficiency in infant rats.** — J. Nutr. 68, 343-357. [Authors' summary modified.] 212

Many of the offspring of vitamin B<sub>12</sub>-deficient rats were hydrocephalic at birth [see *V.B.* 21, 2973; 28, 2252].

The peripheral nerves were poorly myelinated whereas myelination of the brain was only slightly affected. The neurones of the spinal cord showed loss of Nissl substance along with other degenerative changes.

The adrenal glands also showed degenerative changes in accumulation of excess lipid in the fascicular zone. The lungs and kidneys were grossly immature.

There were more cells in some stage of mitosis in the ependyma of the deficient embryonic brain. The preponderance of mitotic figures in an early stage of mitosis and

the general state of immaturity of the other tissues suggest that a metabolic block has slowed the rate of cell division.

Clements, F. W. (1957). **A goitrogenic factor in milk.**—Med. J. Aust. November 2nd, 645-646. 213

C. made a 3 year survey of goitre in schoolchildren. His hypothesis was that goitrogenic substances occur in the milk of cows fed on chou-moellier, one of the Brassicae. Additional weeds now incriminated are the Cruciferae, *Coronopus squamatus*, *C. didymus*, and *Capsella bursa-pastoris*. In Queensland *Rapistrum rugosum* caused goitrogenic milk. Heavy losses of lambs in the Upper Derwent Valley, Tasmania, in 1956, were due to gross thyroid enlargements causing suffocation. The ewes had consumed the weeds *Erodium cicutarium* and *E. botrys*.

—L. N. LOOMIS.

Gillman, J., Gilbert, C. & Epstein, E. (1958).

**Endocrine control of blood sugar, lipaemia, and ketonaemia in diabetic baboons.**—Brit. med. J. November 22nd, pp. 1260-1263. 214

In five baboons pancreatectomy induced a disease comparable with diabetes mellitus in man. Experiments are described to test the effects of other endocrine secretions on the typical changes of diabetes including the blood levels of sugar, fat and ketone bodies. Hypophysectomy of the depancreatized baboons had no effect on disorders of carbohydrate metabolism but ketosis and lipaemia were prevented. Injections of crude anterior pituitary extracts did not restore the lipaemia but resulted again in ketosis. The further

effects on pancreatectomized-hypophysectomized baboons of thyroxine and cortisone injections and of castration were tested. The authors find that all these endocrine influences affect the level of lipaemia and of ketosis. It is suggested that severe lipaemia with a severe ketonaemia can be attributed to marked adreno-cortical activity, active secretion of somatotrophic hormone (S.T.H.) and possibly to moderate activity of the thyroid. A severe lipaemia and a low ketonaemia might be due to pronounced adreno-cortical activity and depressed secretion of S.T.H. A low lipaemia and a low ketonaemia could be attributed to marked depression of the adrenal cortex and thyroid and a corresponding depression of S.T.H.

The authors consider that each case of diabetes mellitus in man should have the lipaemic fractions of the blood determined to ascertain the degree of involvement of various endocrine influences.—R. N. FIENNES.

Straub, O. C., Peoples, S. A. & Cornelius, C. E. (1959). **Ultrafiltrable serum calcium levels in normal Holstein-Friesian cattle and in parturient paresis.**—Cornell Vet. 49, 324-331. [Authors' summary modified.] 215

Total and ultrafiltrable serum calcium levels were determined for Holstein-Friesian cattle from birth to maturity. Preparturient cows had higher protein-bound serum calcium levels than cows during the 72 hours following parturition, whereas ultrafiltrable serum calcium levels were not significantly different. Cows with parturient paresis had calcium levels (both the total and the ultrafiltrable fraction) about 50% lower than control lactating cows.

See also abstr. 322 (book, animal nutrition).

## DISEASES, GENERAL

Weikl, A. (1959). Ferkelkrankheiten: An Hand von Sektionsergebnissen. [Diseases of piglets. Results of post-mortem examinations.]—Tierärztl. Umsch. 14, 249-253. 216

The most important primary cause of death in 2,393 pigs sent for P.M. examination in 5 years was oedema disease (38% of cases), followed by gastro-enteritis (20.5%) and piglet anaemia (15%). The frequency of oedema disease increased during the period. There was no seasonal incidence and only pigs in good condition were affected. The P.M. findings were described.—M.G.G.

Glazier, D. B., Nicholson, J. A. & Kelly, W. R. (1959). **Atrial fibrillation in the horse.**

—Irish vet. J. 13, 47-55. 217

Atrial fibrillation is discussed and the clinical signs listed. Of therapeutic agents quinidine sulphate was best. Fibrillation in a 14-year-old draught mare is described.

—T.E.G.R.

Withers, F. W., Peck, E. F. & Leech, F. B. (1959). **A survey of diseases and losses in dairy cattle in Wiltshire and Devonshire.**—Vet. Rec. 71, 572-574; 577-580 & 581. [Authors' summary modified.] 218

The relation of disease to culling and wastage in Wiltshire and a part of Devon is analysed and estimates are obtained of depreciation in the market value of cows



affected by the more common diseases. These estimates lead to a rough assessment of the relative economic importance of the diseases studied.

The principal causes of morbidity and their incidence are summarised. Some differences between counties and between the two years are discussed.

Characteristics of the herds in the two areas and within the major land-use regions of each area are shown and estimates are obtained of the use of tuberculin testing, *Brucella abortus* Strain 19 vaccination, and milk recording in different types of herd and in different areas.

Beer, J. & Martin, J. (1959). Nichtbakterieller Rinderabortus mit fetaler Hepatopathie. [Non-bacterial abortion in cattle with foetal liver lesions.]—Zuchthyg. FortpflStörung. u. Besamung 3, 97-107. 219

Three aborted foetuses from different cattle herds had liver lesions, oedema, ascites and other changes similar to those reported by Howarth *et al.* from California [see *V.B.* 26, 3245]. Bacteriological and animal inoculation tests, and serological examination of the dams did not reveal the cause. The possibility of a nutritional origin is discussed.—M.G.G.

Singh, A. (1959). On the microscopic structure of haemal nodes of buffalo calves.—Brit. vet. J. 115, 271-273. [Author's summary modified.] 220

S. described the microscopic structure of haemal (haemolymph) nodes of buffalo calves in some detail; he noted deviations from the conventional description. He discussed the bearing of haemopoiesis on blood diseases.

MacKinnon, M. M. (1959). A pathological study of an enzootic paradontal disease of mature sheep.—N. Z. vet. J. 7, 18-26. 221

Paradontal disease is briefly discussed and a description is given of the gross and microscopic lesions of an enzootic form of the condition in young adult sheep in New Zealand. Aetiology is also discussed.—T.E.G.R.

Karatai, S. S. (1959). [Eradication of infectious atrophic rhinitis from a herd of pigs.]—Veterinariya, Moscow 36, No. 8 pp. 32-33. [In Russian.] 222

Infectious atrophic rhinitis was eradicated in 8 months from a pig farm by the following measures: isolation of diseased animals, disinfection, good management of healthy pigs, and protection of new-born piglets by intra-

nasal instillation of penicillin or streptomycin twice daily for the first 15 days and daily i/m injection of vitamin D from the third day of life. This treatment also cured diseased pigs.

—M.G.G.

Obel, A.-L. (1959). Studies on a disease in mink with systemic proliferation of the plasma cells.—Amer. J. vet. Res. 20, 384-393. 223

Literature on plasma cell leukaemia in man is reviewed. A disease, similar in many respects, occurred in 36 mink, mainly mutation mink. Clinical symptoms (anaemia, emaciation and polydipsia) appeared only in the terminal stage. At P.M. examination the spleen was almost invariably enlarged, with greyish red pulp; enlarged lymph nodes were observed in half the animals and enlarged, grey kidneys with dark flecks in the cortex were often seen—in the majority of these animals there were signs of uraemia. Bence-Jones protein was demonstrated in 4 of 5 urine samples. Microscopic lesions are described. The findings in mink are considered in relation to those in plasmacytoma in bone marrow, plasma cell leukaemia and reactive plasmacytosis in man.

—T.E.G.R.

Vaida, M. (1959). Die squamöse Sohlenhaut-entzündung der Kaninchen (Pododermatitis squamosa plantae cuniculorum). [Squamous inflammation of the plantar pads in rabbits.]—Wien. tierärztl. Mschr. 46, 380-388. [Summaries in English, French and Italian.] 224

This disease affects heavy rabbits kept in small, unclean cages. It is due to poor blood circulation in the pads, ammonia from soiled bedding, and staphylococci. The mortality rate is 80-90%. It is cured by application of 0.2% aluminium acetate soln. and provision of suitable bedding.—M.G.G.

I. Walsh, J. J. & Burch, G. E. (1959). The rate of disappearance from plasma and subsequent distribution of radiocadmium ( $Cd^{115m}$ ) in normal dogs.—J. Lab. clin. Med. 54, 59-65. 225

II. Burch, G. E. & Walsh, J. J. (1959). The excretion and biologic decay rates of  $Cd^{115m}$  with a consideration of space, mass and distribution in dogs.—Ibid. 66-72. 226

I. From 27 to 36% of intravenously injected Cd left the plasma per min. During the same period between one-tenth and one-half of 1% of the tracer returned to the plasma from extraplasmal compartments.

The rate of disappearance of radio-

cadmium from plasma was greater than from erythrocytes or whole blood. Initially, the concentration in erythrocytes rose as the plasma concentration fell, then remained approximately constant for 24 to 48 hours. Cd was detected in faeces but not in urine. The distribution of radiocadmium was widespread and quite variable in many tissues of 4 dogs, 2, 24, and 48 hours after injection.

II. The biological half-life of Cd was long because of relatively slow excretion. Excretion was most rapid in faeces. Because of its great tendency to sequestration and unequal distribution among body tissues, space and mass of cadmium could not be satisfactorily estimated.—R.M.

Russell, R. S. & Garner, R. J. (1959). **Uptake of strontium by pasture plants and its possible significance in relation to the fall-out of strontium-90.** — *Nature*, London 183, 1806-1807. 227

Disagreement is expressed with the conclusion of Vose & Koontz (1959) that clover, which absorbs more  $\text{Sr}^{90}$  and Ca than grass, should be excluded from pastures if concentrations of  $\text{Sr}^{90}$  in milk rise dangerously. It is pointed out that the ratio of  $\text{Sr}^{90}$  to Ca in the milk depends on that in the herbage, and that this is similar in grass and in clover; the higher Ca content of clover could mean less absorption of  $\text{Sr}^{90}$  by the aerial tissues than in grass; certain legumes with deep roots would absorb less  $\text{Sr}^{90}$  than grass since most deposited  $\text{Sr}^{90}$  is retained in the upper 5 cm. of soil.

—M.G.G.

Eisenbud, M. (1959). **Deposition of Strontium-90 through October 1958.**—*Science* 130, 76-80. 228

Strontium-90 deposition is discussed in relation to the contamination of food, and uptake of the isotope in the skeleton of man. This brings the previous reports up to date.

Consideration is given to methods of measurement, pattern of fallout, future deposition, absorption by man, and estimates of future absorption by man.

Between June 1957 and October 1958 the stratospheric reservoir increased from 1.4 to 4.3 megacuries  $\text{Sr}^{90}$ . Approximately 90% of the debris now stored in the stratosphere will have been deposited by 1970.

In the New York area milk averaged 3.9 units in 1957 and 5.9 units in 1958. The maximum future level in milk resulting from tests conducted up to Nov. '58 is estimated to be 11

units, and this would give a radiation dose of about 5% of the dose due to natural radioactivity.—M. K. LLOYD.

Anderson, W., Burton, L. K. & Crookall, J. O. (1959). **Current trends of strontium-90, strontium-89 and caesium-137 levels in milk.** —*Nature*, Lond. 184, 89-91. 229

A sharp increase in the concentrations of these 3 isotopes in milk in Wales during 1958, particularly of the short-lived strontium-89, and correlation of the  $\text{S}^{89}/\text{S}^{90}$  ratio in milk with that in rain water indicated that concentrations in milk depend more on the rate of deposition than on the total amount deposited. —M.G.G.

Bürgisser, H., Fankhauser, R., Klingler, K. & Schneider, P. A. (1959). Beiträge zur Neuropathologie der Wildtiere. [**Neuropathology in wild animals.**]—*Schweiz. Arch. Tierheilk.* 101, 112-134. [Summaries in English, French and Italian.] 230

Brains from 403 mammals and 97 birds were examined and pathological changes were found in 99 cases. The findings were classified into malformations, metabolic disturbances, inflammation, vascular lesions, spinal cord lesions and poisonings. Among the conditions encountered were microphthalmia in deer, aspergillosis in swans, purulent salmonella encephalitis in monkeys, toxoplasma encephalitis in hares, calcification of cerebral vessels in hare and field mouse, subependymal granuloma in hare, and degeneration of peripheral nerves caused by thallium poisoning in rooks. [18 illustrations.]—R.M.

Mena, I., Kivel, R., Mahoney, P., Mellinkoff, S. M. & Bennett, L. R. (1959). **A method for increasing the sensitivity of the rose bengal  $\text{I}^{131}$  liver function test with the use of bromsulphalein.**—*J. Lab. clin. Med.* 54, 167-173. [Authors' summary modified.] 231

In the presence of mild liver disease the uptake of rose bengal labelled with radioiodine by the liver is within normal range. A useful separation of abnormal patients from normal can be achieved by i/v administration of 2.5 mg./kg. BSP; this depresses rose bengal uptake in patients with liver disease, but does not affect normal individuals.

Meyer, K.-H. (1959). Beitrag zur Behandlung von Zitenerkrankungen. [**Treatment of diseases of the teat.**]—*Tierärztl. Umsch.* 14, 79-82. 232



A polyethylene cannula has given good results in the treatment of inflammation and stenosis of the teat canal and post-operative treatment of teat perforation and fistula. It can be left in position for 10-12 days, but

fresh antibiotic ointment should be injected into it daily. In teats with perforation and fistula, the stopper at the base of the cannula should not be fitted for 2-3 days, to allow the milk to escape.—M.G.G.

## POISONS AND POISONING

Middendorf, F. (1958). Mineralstoffuntersuchungen in der Milch gesunder und an Fluorose erkrankter Rinder. [**Minerals in the milk of healthy cattle and cattle with fluorosis.**]—Inaug. Diss., Hanover pp. 32. 233

Six to seven samples of milk were taken in the course of 6 months from each of 12 cows with fluorosis. The concentrations of Ca, Mg and P were lower than those reported in the literature for normal cows and those of Cl, Na and K were higher. These differences, however, were considered to be due to differences in feeding and in examination technique and not to the fluorosis.—M.G.G.

Suttie, J. & Phillips, P. H. (1959). **Studies of the effects of dietary sodium fluoride on dairy cows. V. A three-year study on mature animals.**—J. Dairy Sci. 42, 1063-1069. [Authors' summary modified.] 234

The effects were studied of feeding 30 and 50 p.p.m. fluorine (as NaF) to mature, adequately nurtured cows over three lactations. Fluorine in the bones, urine and, to some extent, the soft tissues was increased. At both rates of intake some exostosis was evident in the excised long bones after they had been cleaned of adhering tissue. It was not discernible before slaughter, nor did it affect gait. There was no impairment of lactation, and body weight was maintained. In these cows the incisor teeth were not clinically affected by fluorine ingestion.

Baker, A. H., Whitney, G. F. H. & Worden, A. N. (1958). **Insecticidal aerosols.**—Lancet November 29th, p. 1177. 235

Over twelve months records were kept of the output of dicophane (DDT)/lindane mixtures, aldrin, or azoxybenzene from continuous flow aerosol units in five laboratories. There is a range of doses of dicophane/lindane at which effective fly control is possible with safe operation. The upper limit of this range lies between 0.53 and 0.75 g. d. t. (g. per day per 1,000 cu. ft.) for budgerigars and, perhaps for mice although the latter probably have a higher degree of tolerance. The upper limit for dogs lies above 0.22 g.d.t. For rats it is above 0.53 g.d.t. For

human beings it is above 0.75 g.d.t. with intermittent exposure for a total of 206 hours.

Budgerigars are unusually susceptible to lindane, probably as a result of preening their feathers. Mouse hair was found to be practically free from lindane deposition. Vaporized aldrin at 0.5 g.d.t. or azoxybenzene at 0.43 g.d.t. used to control horticultural pests did not offer any toxic hazard to man, budgerigars, mice, hamsters or g.pigs.

—W.A.P.

Juszkiewicz, T., Madejski, Z. & Gorzelewska, K. (1959). Badania doświadczalne nad toksycznością fluorku sodowego u świń. Doniesienie wstępne. [**Toxicity of sodium fluoride for pigs. Preliminary report.**]—Med. Wet., Warszawa 15, 294-296. [In Polish. Summaries in English and Russian.] 236

Single doses of sodium fluoride to 65 pigs, at therapeutic levels of 0.25 and 0.3 g. per kg. body wt., or mixed with food as 1 or 2% mixture, caused no change in the levels of serum calcium and magnesium, and blood glucose, but there was a slight rise in the serum inorganic phosphorus.—M. GITTER.

Sievert, A. H. & Phillips, P. H. (1959). **Metabolic studies on the sodium fluoride-fed rat.**—J. Nutr. 68, 109-120. [Authors' summary modified.] 237

Fat metabolism was studied in rats given a ration containing 0.1 or 0.15% NaF.

Mitochondrial fatty acid oxidase activity was unaffected in the liver but was strikingly decreased in the kidney. Concurrent changes in the kidney were a decrease in the fat and nitrogen content, and hypertrophy of the organ.

Fluoride-fed rats excreted more faecal fat, nitrogen and dry matter than the control animals. The decreased retention of these nutrients could not be ascribed to an increase in intestinal motility or to starvation.

Dietary fluoride did not interfere with the acetylation of para-aminobenzoic acid by the intact rat. This suggests that the utilization of coenzyme A in this acetylation reaction, and presumably in those of fat metabolism, was not inhibited.

Bobke, J. D. (1958). Verträglichkeitsversuche mit "Superphosphat" an Rindern. [**Influence of ingested superphosphate of lime on cattle.**]—Inaug. Diss., Hanover pp. 76. 238

No clin. symptoms or changes in milk yield appeared in cattle fed 50 or 100 g. superphosphate of lime daily for up to 112 days. The bone ash of 2 cattle fed 100 g. superphosphate supplying 5 mg. fluorine per kg. body wt. daily for 78 days or 3.5 mg./kg. fluorine daily for 69 days contained 0.25% and 0.16% fluorine respectively. Feeding superphosphate raised the inorganic phosphorus content of the blood, but did not influence the calcium content.—M.G.G.

Stookey, G. K. & Muhler, J. C. (1959). **Effect of molybdenum on fluoride retention in the rat.**—Proc. Soc. exp. Biol., N.Y. 101, 379-380. [Authors' summary modified.] 239

In rats that drank water containing 50 p.p.m. Mo as ammonium molybdenate, significantly more fluoride was retained in skeletal muscle and carcass, than in controls that drank water free from Mo. These data suggest that Mo may act metabolically to increase availability of fluoride ion.

Gallagher, C. H. & Koch, J. H. (1959). **Action of pyrrolizidine alkaloids on the neuro-muscular junction.**—Nature, Lond. 183, 1124-1125. 240

Median lethal doses of heliotrine and lasiocarpine caused death in rats by their toxic action on the liver [*V.B.* 28, 2294]. Larger doses produced progressive muscular weakness, respiratory distress and death from respiratory failure within 30 min., suggesting the occurrence of neuro-muscular block.

—R.M.

Grennberg, J., Taylor, D. J., Bond, H. W. & Sherman, J. F. (1959). **Toxicity of amine-extracted soya bean meal.**—J. agric. Food Chem. 7, 573-576. [Authors' summary modified.] 241

About 80% of chicks fed amine-extracted residues of soya bean meal as 40% of the diet died within 10 days. Chicks fed residues extracted with acetone, ethyl alcohol, or trichloroethylene appeared normal. Other protein foods extracted with triethylamine were toxic in varying degrees, but triethylamine extracted gelatin and casein were tolerated.

Dollahite, J. W. (1959). **Toxicity of *Drymaria arenarioides* for cattle, sheep, and goats.**—J.

Amer. vet. med. Ass. 135, 125-127. [Author's summary modified.] 242

*D. arenarioides* (alfombrilla) has been reported as causing heavy losses in cattle in northern Mexico. Feeding trials in Texas showed that as little as 0.1% of the body weight fed to a sheep resulted in death within 21 hours. Each animal that was "force-fed" as much as 0.25% of its body wt. of the weed became ill, and all those forced to eat as much as 0.5% died.

Yelf, J. D. (1959). **The toxicity of creeping indigo in Fiji.**—Agric. J., Fiji 29, 9-10. 243

Four cows were fed rations containing 25-100% of *Indigofera endecaphylla*. The 3 that were in calf aborted, with retention of the placenta. The fourth lost weight. It is recommended that this plant should not be used as a pasture or cover crop in Fiji.—M.G.G.

Kingsbury, J. M. (1959). **Toxicity of *Apocynum* (dogbane) to stock; a correction.**—Cornell Vet. 49, 285-287. 244

The practice of omitting references from scientific publications is condemned since data cannot be checked and erroneous information finds its way into the literature and becomes established as scientific fact. This happened in the case of *Apocynum* (dogbane), which was wrongly incriminated for poisoning livestock. Apparently the information was drawn from an account of the toxicity of *Apocynum* sp. published in *Circ. N. Mex. agric. Exp. Sta.* No. 71. (1922); this was essentially a verbatim reproduction of part of the summary of *Bull. Ariz. agric. Exp. Sta.* No. 59 (1909) giving the results of experiments on the toxicity of *Nerium* (oleander), also belonging to the Apocynaceae. Therefore, all undocumented information on the toxicity of *Apocynum*, appearing since 1922, should be discounted.

—T.E.G.R.

I. Perrin, D. D. (1959). **Photosensitivity diseases in New Zealand. XV. A chemical procedure for the detection of facial eczema toxicity in pasture.**—N.Z. J. agric. Res. 2, 266-273. [Author's summary.] 245

II. Sandoz, J., Clare, N. T. & White, E. P. (1959). **Photosensitivity diseases in New Zealand. XVI. Improved procedure for the beaker test for facial-eczema toxicity.**—Ibid. 623-626. [Authors' summary modified.] 246

I. An empirical chemical method (beaker test) for the detection of facial eczema toxicity in pasture is described. Most pasture samples collected from 7 areas over 1-3 autumns



showed good correlation between this test and toxicity as assessed by guinea-pig feeding. The substance which is the basis of the test is not the facial eczema poison. Samples from 6 other areas which did not produce toxic pasture did not give positive chemical tests. Of 35 pure species of plants similarly tested only *Mentha* and related species, especially pennyroyal, gave spurious chemical tests.

II. A simpler, quicker and more sensitive procedure for the "beaker test" [see I above] is described. The new method eliminates interference due to pennyroyal.

Mitchell, K. J., Walshe, T. O. & Robertson, N. G. (1959). **Weather conditions associated with outbreaks of facial eczema.**—N.Z. J. agric. Res. 2, 584-604. [Authors' summary modified.] 247

A season is potentially dangerous either if the soil temperature at 8 inches, measured at 9 a.m., has reached an average of 62.5°F. or over during November, or if the main body moisture in the soil, as distinct from surface layers wetted by smaller rains, has reached a deficit of 1½ in. by the end of November.

A more definite judgment can be made by the end of December. There is a high probability of subsequent outbreaks if soil temperatures at 8 in. average 65°F. during December, and if there is no "soaking" rain during December.

The commencement of the first toxic period in a season, as judged by liver damage in lambs grazing in the field, appeared to be preceded either by two or more periods when rainfall was accompanied or immediately followed by two or more successive nights with grass-minimum temperatures of 54°F. or over, or alternatively by a single prolonged group of high grass-minimum temperature with rain. Also rain that was judged to initiate the first toxic period was itself accompanied or immediately followed by two or more successive nights when grass-minimum temperatures were 54°F. or higher.

Brown, J. M. M. (1959). **Advances in "Geeldikkop" (tribulosis ovis) research. I. The history of "Geeldikkop" research.**—J. S. Afr. vet. med. Ass. 30, 97-111. 248

This is a most interestingly written account

of the development of knowledge on tribulosis which should be read by all interested in diseases of ruminants characterized by liver damage and photosensitization.

The resemblances between tribulosis and "facial eczema" of sheep in New Zealand are mentioned and reference is made to the recent important finding in that country [V.B. 29, 228, 2609, 2610] that a fungus, *Sporidesmium bakeri*, which parasitizes pasture plants, can elaborate a hepatotoxin capable of producing the disease. The author states that the lead furnished by these findings is being followed up and a number of fungi growing on *Tribulus terrestris* have been isolated and are being studied.

Malherbe, W. D. (1959). **Intrahepatic cholestasis in a Rhodesian Ridgeback dog: a clinicopathological study.**—J. S. Afr. vet. med. Ass. 30, 113-124. [Author's summary modified.] 249

Primary intrahepatic cholestasis is a form of biliary obstruction which has apparently not been described in veterinary literature. This paper records a clinicopathological study for some 2½ months of this syndrome which resulted from accidental subacute poisoning or sensitization of a dog with acetarsol. It was characterized by severe icterus, relatively acholic, clayey faeces, high values for plasma alkaline phosphatase, total cholesterol, total and conjugated bilirubin. Tests for liver damage were generally negative. There was eosinophilia but no anaemia. Differential diagnosis was discussed.

Terriere, L. C., Arscott, G. H. & Kiigemagi, U. (1959). **The endrin content of eggs and body tissue of poultry receiving endrin in their daily diet.**—J. agric. Food Chem. 7, 502-504. 250

Spectrophotometric analysis showed no contamination of the eggs of hens fed a ration containing 0.1 p.p.m. of endrin for 8 weeks, but 0.2 and 0.3 p.p.m., respectively, appeared in the eggs of hens receiving a dietary concentration of 0.25 or 0.75 p.p.m. Contaminated eggs were still laid 4 weeks after endrin ceased to be fed. Up to 0.2 and 3.6 p.p.m., respectively, were found in meat and fat from the birds.—M.G.G.

## PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

Straub, O. C. & Gütte, J. O. (1959). **Some observations on the use of synthetic oxytocin in sows.**—J. Amer. vet. med. Ass. 135, 171-174. [Authors' summary modified.] 251

Synthetic oxytocin was used on 33 sows and proved effective in treating 2 animals with secondary uterine inertia; it stimulated the let-down of milk in 2 cases of agalactia, and in 21 cases of mastitis. The milk let-down response and milk production occurred after i/v injection of this hormone in 7 normal sows. The doses recommended for mature sows are: 5 to 10 units i/v and 15 to 20 units i/m.

Siggel, H.-J. (1958). Ein Beitrag zur Frage der therapeutischen Breite bei der intraperitonealen Narkose. [**Safety of intraperitoneal barbiturate anaesthesia.**]—Inaug. Diss., Hanover pp. 27. 252

A few deaths consistently occurred when mice and g.pigs were submitted to i/p anaesthesia with pentobarbitone sodium, hexobarbitone, methitural or thiopentone sodium. It is recommended that a safe dose of barbiturate should be combined with an inhalant anaesthetic.—M.G.G.

Myers, B. A. & Ross, D. A. (1959). **Effects of iodine and thyroxine administration on the Romney crossbred ewe.**—N.Z. J. agric. Res. 2, 552-574. [Authors' summary modified.] 253

Two trials to compare the effects of thyroxine implantation, injection of potassium iodide, and Neo-Hydriol (iodized poppyseed oil) on Romney ewes, showed that none of the treatments had any significant effect on weight or grade of the fleece.

Several observations indicated the existence of borderline environmental iodine deficiency which may account for slight stimulation of wool growth by thyroxine treatment.

A daily dose equivalent to 0.7 mg. of iodine injected as KI was adequate for a sheep's nutritional requirement, while an injection of 1 ml. of Neo-Hydriol provided supplementary iodine for a considerable period.

Henrickson, R. L., Nelson, A. B., Costello, W. J., Urban, K., Pope, L. S., Odell, G. V.

& Reuber, H. W. (1959). **Effects of feeding or injecting certain tranquilizers on beef cattle performance, and residues in the carcass.**—Misc. Publ. Okla. agric. Exp. Sta. No. MP-55 pp. 110. [Authors' summary modified.] 254

There was wide variation between animals in the degree of tranquillization from a given dose. When weanling calves were given i/m inj. of "Diquel" (ethyl isobutrazine) or a phenothiazine derivative referred to as "SKF 5354A" only about half showed clinical tranquillization, and this lasted less than 48 hours. Doses 2-2.5 mg./kg. body wt. had greater effect than 1.5 mg./kg. Tranquillizer had no effect on weight gains of calves at weaning or the 21 to 33 day period following weaning.

Addition of "Compazine" (prochlorperazine) to the feed of yearling steers did not improve rate of gain, feed efficiency, or carcass merit.

Small quantities of residual chlorpromazine were found in the fat, brain, heart, lung, and kidney of beef animals injected with the drug. Animals held for 72 hours after injection had no residual compound in any tissue. Lean muscle contained no residue regardless of dose.

It was concluded that tranquilizers had small possibilities for increasing profit in meat animals.

Hogle, R., Kingrey, B. W. & Jensen, E. C. (1959). **Skin grafting in the horse.**—J. Amer. vet. med. Ass. 135, 165-170. [Authors' summary modified.] 255

It is possible to accomplish free skin transplantation on the horse.

Such grafts hasten the healing process and minimize blemishes. The resulting graft, however, usually remains obvious.

The amount of after-care required and the somewhat variable results limited use of the procedure to selected cases that did not heal by conventional handling and where minimal scar formation was especially important.



## PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

Berman, A. & Kibler, H. H. (1959). **Effect of clipping the coat on the thermoregulatory reactions of dairy heifers.** — *Nature*, Lond. 183, 606-607. 256

Four heifers, 2 Brown Swiss and 2 Holstein, 20 months old, previously exposed for a month to high temperatures, were kept for 2 weeks in a climatic chamber at a constant temp. of 89.1°F. and relative humidity of 69%. After the first week the animals were clipped. In the second week there were significant increases in surface temp., food consumption and heat production. Other, non-significant changes were decreases in respiration rate, ventilation rate, total and pulmonary vaporization, and increases in tidal air volume and water consumption. Rectal temp. was 103° in the first week and 102.9° in the second week.

—M.G.G.

I. Bianca, W. (1959). **Acclimatization of calves to a hot dry environment.**—*J. agric. Sci.* 52, 296-304. 257

II. Bianca, W. (1959). **Acclimatization of calves to a hot humid environment.**—*Ibid.* 305-312. 258

III. Bianca, W. (1959). **The effect of clipping the coat on various reactions of calves to heat.**—*Ibid.* 380-383. [Author's summaries modified.] 259

I. Three calves were exposed in a climatic room to an environment of 45°C. dry-bulb and 28°C. wet-bulb temperature for 21 days up to 5 hours each day.

In the 21-day period, mostly during the first half of it, the following reactions were observed: progressive reductions in rectal temperature, in heart rate and in respiratory rate with a change of breathing from a laboured to a less laboured type.

It was suggested that a decrease in metabolic heat production might play a part in the observed acclimatization.

II. In 3 calves exposed to an environment of 40°C. dry-bulb and 38°C. wet-bulb temp. for up to 110 min. each day for 1-2 weeks, there were progressive changes in physiological reactions to heat. (a) Rectal temp. and skin temp. (for a given time of exposure) declined. In consequence there was a marked increase in the tolerance time, *i.e.*, in the time for which the animals could withstand the hot environment before reaching a rectal temp. of 42°C. (b) Respiratory rate rose earlier and assumed higher levels (for given

levels of body temp.). (c) Heart rate decreased markedly.

These changes are discussed; they are interpreted as reflecting chiefly a reduction in metabolic heat production.

III. Ten calves were exposed for 3 hours to an environment of 40°C. dry-bulb and 33°C. wet-bulb temperature (a) with their normal coats, and (b) after their coats had been clipped. When clipped the calves tolerated the same hot environment better than they did before they were clipped, as evidenced by significant reductions in skin temp., rectal temp., respiratory rate and heart rate, as well as by a lessening of distress. This effect of clipping was thought to be due mainly to an improvement in skin evaporative cooling.

Taneja, G. C. (1958). **Effect of high air temperature on pregnancy in cattle.**—*Indian J. vet. Sci.* 28, 101-107. [Author's summary modified.] 260

Twelve Australian Illawarra Shorthorn cows were divided into four groups of three. One group was a control. Animals in the three test groups were exposed to high room temperature (105°F. dry-bulb, 86°F. wet-bulb) for 7-8 days centring round the 10th, 30th and 50th days of pregnancy respectively, and again at about 4 months' pregnancy.

During the entire heat exposure, the morning body temp. of the test animals was higher than that of controls, while the evening body temp. reached a critical level of 106° to 107°F. each day.

Under heat stress, pregnancy proceeded normally in all except one cow which after heat treatment returned to oestrus. Body weights of the calves born to heat-treated cows were the same as in the controls. It appears that this breed is relatively well adapted to hot environments.

Cockrem, F. (1959). **Effect of a sympathomimetic agent (methoxamine hydrochloride) on growth of hair in the house mouse (*Mus musculus*).** — *Nature*, Lond. 183, 614-615. 261

Experiments on mice tested the effects of methoxamine hydrochloride on the time taken for spread of the "wave" of hair growth and on the amount of hair grown during the cycle. Results indicate that control of blood supply can be of importance to these processes. Experiments are being carried out with vasodilator substances and relationships

between body growth, "wave" of hair growth and weight of hair grown are under investigation.—T.E.G.R.

McCance, R. A. & Widdowson, E. M. (1959).

**The effect of lowering the ambient temperature on the metabolism of the new-born pig.**—*J. Physiol.* 147, 124-134. [Authors' summary modified.] 262

Normal new-born piglets were kept in metabolism cages without food or water for 24 hours at 12° and 31°.

The rectal temperatures of the animals kept at 12°C. were reasonably well maintained for 8-12 hours, but by 24 hours had fallen to 20-23°. Carbohydrate provided most of the energy for starving new-born piglets.

Clark, I., Geoffroy, R. F. & Bowers, W. (1959). **Effects of adrenal cortical steroids on calcium metabolism.**—*Endocrinology* 64, 849-856. [Authors' summary modified.] 263

Radioactive calcium ( $\text{Ca}^{45}$ ) was used to investigate the effects of hydrocortisone and prednisolone on calcium metabolism in the rat. Absorption of Ca by the intestines was unimpaired by the administration of hydrocortisone. Administration of hydrocortisone or prednisolone to rats recently injected with Ca resulted in increased urinary radiocalcium. Uptake of Ca by the femurs of both normal and nephrectomized rats was inhibited by hydrocortisone. Inanition resulted in a very slight inhibition of Ca uptake by bone. Hydrocortisone exerted no observable mobilization on total bone calcium.

Linzell, J. L. (1959). **Physiology of the mammary glands.**—*Physiol. Rev.* 39, 534-576. 264

A general account, written for non-specialist physiologists, of developments since 1944. It deals with general and comparative anatomy, gland growth, lactation, involution, milk secretion and synthesis, physiology of the teat, role of the nervous system. [473 references.]—R.M.

Gourlay, R. N. (1959). **Some observations on the haematology of zebu cattle in Uganda.**—*Brit. vet. J.* 115, 277-280. [Author's summary modified.] 265

G. studied the blood picture of 60 apparently normal healthy adult zebu cattle in Uganda. He described the techniques employed and compared the results with those obtained by other authors.

Desliens, L. & Desliens, R. (1959). **Viscosimétrie sanguine chez les animaux. Deuxième note. Valeur et variations de la viscosité sanguine à l'état normal. [Viscosity of the blood in animals. II. Normal values and variations.]**—*Bull. Acad. vét. Fr.* 32, 29-45. 266

The viscosity of arterial and venous blood in horses and cattle increased during muscular activity, owing to increase in r.b.c. content. Viscosity of both venous blood and plasma increased on constriction of the vein and decreased during copious bleeding; this was considered to be due largely to the exchange of fluid with the tissues through the capillary walls. The significance of these findings for blood examination was discussed.—M.G.G.

Ribeiro Netto, A. & Pereira Lima, F. S. (1959). **Nota sobre a taxa de colesterol sérico total de equinos, puro sangue de carreira. [Cholesterol content of serum from Thoroughbred racehorses.]**—*Rev. Fac. Med. vet., S. Paulo* 6, (1957). 5-8. [English summary modified.] 267

Total cholesterol in serum from 20 Thoroughbred horses averaged  $102 \pm 7$  mg./100 ml. of serum. When compared with other published data, the results are considered low.

Steel, K. J. (1959). **The sulphhydryl content of horse serum.**—*Brit. vet. J.* 115, 281-283. [Author's summary modified.] 268

The sulphhydryl content of samples of horse serum was estimated by three methods, using normal and deproteinized serum. All methods yielded a mean result of the order of 95 moles of sulphhydryl per 100 ml. of serum. A comparison of this value with that for other species was made but, as the blood and serum sulphhydryl contents do not usually bear any relation to one another, such comparisons are not of great value. It is believed, however, that horse serum is richer in sulphhydryl than that of man and of other domesticated animals.

Smith, R. H. (1959). **The development and function of the rumen in milk-fed calves.**—*J. agric. Sci.* 52, 72-78. 269

The volume of contents of the rumen increased about fourfold between 6 and 30 weeks of age. In calves up to 32 weeks old very little ingested milk entered the rumen (less than 5%); the amount entering did not increase during this period of growth. Dilution of polyethylene glycol was used to estimate volume of rumen contents and rate of flow of



fluid into and out of the rumen. Only traces of magnesium were absorbed through the wall of the rumen.—R.M.

Tulbaev, P. (1959). [Dependence of response to mechanical stimuli of the stomachs of the goat on type of feeding during the first seven weeks of life.] — Sechenov J. *Physiol.* 45, 549-555. [In Russian. Summary in English.] 270

All compartments of the stomach responded less to the stimulus of inflation of a balloon in goats given bran between 17 and 25 days of age or hay between 40 and 50 days compared with the response of goats given milk alone. Reduced sensitivity was greater in rumen and reticulum than in omasum and abomasum.—R.M.

Ash, R. W. (1959). Inhibition and excitation of reticulo-rumen contractions following the introduction of acids into the rumen and abomasum. — J. *Physiol.* 147, 58-73. [Author's summary modified.] 271

The forestomach of conscious sheep continued to contract after removal of the digesta. In most the frequency of the contractions was within normal range.

Buffered solutions of acetic, propionic and butyric acid at pH 3.6-5 inhibited contractions, caused a marked fall in pH and a large increase in the concentration of steam-volatile fatty acid in the carotid blood. The onset of inhibition was not directly related to these changes. Non-fatty acid buffers in a similar pH range and concentration did not inhibit, nor did they produce rapid and marked changes in pH of the carotid blood.

It is concluded that the effects obtained with acid solutions were not simply a local pH effect but were related to the rapid penetration of free fatty acid through forestomach epithelium. Since inhibition was produced by fatty acid vapour with only minor changes in pH, concentration of total CO<sub>2</sub> and steam-volatile fatty acid of the blood, inhibition seems to be due to peripheral stimulation of acid-sensitive receptors in the forestomach rather than to central nervous effects of chemical changes in arterial blood.

Dedashev, Y. P. (1959). [Conditioned reflexes in the motor activity of reticulum and rumen in sheep.] — Sechenov J. *Physiol.* 45, 483-486. [In Russian. Summary in English.] 272

By combining sound signals from an electric bell with feeding of oats and hay, conditioned contractions of the reticulum were

established after about 75 consecutive attempts and of the rumen after about 52 attempts. —R.M.

Eayrs, J. T. (1959). The status of the thyroid gland in relation to the development of the nervous system. — *Animal Behaviour* 7, 1-17. 273

The literature is critically reviewed with particular emphasis on the author's own studies of the effects of post-natal ablation of the thyroid by surgical, chemical or radio-methods, in the rat in which the central nervous system is little differentiated at birth. In the cretinoid rat innately organized patterns of behaviour were all retarded together with physical development after the first 12 days post-thyroidectomy. In later life, these rats were incapable of reacting adaptively to environmental change. These deficiencies were associated with structural changes in the nervous tissues, particularly with reduced myelination, hypoplasia of the cell processes forming the cortical neuropile, and an altered vascular pattern. These changes were not found in normal rats of similar age which had been pair-fed with the athyroid animals nor in younger animals of similar weight. Substances promoting protein anabolism failed to ameliorate the effects. Although histological and behavioural evidence suggested that these experimentally induced effects in the infant rat were reversible on administration of thyroid hormone, irreversible changes were detected by enzymological methods. Contrary to that found in amphibia, there was little evidence that thyroid hormone acted specifically and directly on the development of the conducting elements or that it hastened maturation of the nervous tissue of normal rats. Thyroid deficiency producing anoxia, lesions in cellular matrix and changes in cranio-neural relationships was postulated as a secondary influence on the course of neural maturation.—J. E. HAMMANT.

McDonald, I. R. & Reich, M. (1959). Corticosteroid secretion by the autotransplanted adrenal gland of the conscious sheep. — J. *Physiol.* 147, 33-50. [Authors' summary modified.] 274

The sheep's autotransplanted adrenal gland secretes significant amounts of biologically active delta<sup>43</sup>-ketosteroids, and is readily accessible for repeated sampling of adrenal venous blood when the animal is conscious and undisturbed.

In the normal state the predominant corticosteroid in adrenal venous effluent is cortisol, which is secreted at rates varying between 0.04 and 0.60 mg/hour. Very small amounts of corticosterone, cortisone, and an unidentified ketosteroid are detectable.

In the conscious sodium-depleted state, aldosterone is always present in the adrenal venous effluent, and is secreted at rates of 0.006–0.024 mg/hour. In severe sodium depletion the secretion rates of cortisol and corticosterone are significantly raised.

Intravenous injection of ACTH caused a prompt increase in the rates of secretion of cortisol and corticosterone.

The autotransplanted adrenal gland is suitable for detailed study of adrenal function in the sheep.

Mackie, A. M. & Nisbet, A. M. (1959). **The histology of the bovine muzzle.** — J. agric. Sci. 52, 376–379. [Authors' summary modified.] 275

Structure of the muzzle of the cow, its blood supply and the histochemistry of its glands were studied.

The nasolabial glands are multilobular compound tubulo-acinar glands similar to salivary glands. They secrete a watery fluid containing mucin and may be sweat gland homologues. Arterio-venous anastomoses are present in the muzzle. Their possible function is discussed. Although the muzzle differs from the rest of the integument no particular function can be ascribed to it on the basis of these findings.

Jamieson, N. D. (1959). **Rumen nitrate metabolism and the changes occurring in the composition of the rumen volatile fatty acids of grazing sheep.** — N.Z. J. agric. Res. 2, 314–328. [Author's summary modified.] 276

See also abst. 90 (stimulation of blood formation in calves by administration of rumen infusoria).

## PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

Marcenac, N. & Leroy, G. (1959). **Le banque de sang de chien d'Alfort. [Blood bank for dogs at Alfort.]** — Rec. Méd. vét. 135, 299–304. [Summaries in English and Spanish.] 278

The blood bank at Alfort serves a dual

Adult sheep and weaned lambs grazing ryegrass and clover, and sampled at monthly intervals, exhibited marked variations in the molecular percentage composition of the individual rumen volatile fatty acids. These variations were characterized by comparatively large changes in the percentage of acetic acid and compensatory changes in an inverse direction in the percentages of propionic and, to a smaller extent, n-butyric and the branched-chain acids.

Similar changes in the relative amounts of acetic, propionic, and to a less extent n-butyric acids, can be induced by the oral administration of nitrate or nitrite to sheep on pasture. Two factors may be operating to alter the composition of the volatile fatty acids of the rumen; one the known variable nitrate content and the other the protein content of the pasture.

A lowered molecular percentage of acetic acid may be due to a lack of acetic precursors usually present in the rumen; these probably being soluble carbohydrate or plant organic acids. Such a deficiency might be absolute, or brought on by the competitive removal of these substrates in their function as hydrogen donors required to bring about the reduction of nitrate to ammonia. Such conditions can apparently occur during periods of high protein levels in the pasture.

Jirka, M. & Kotas, J. (1959). **Some observations on the chemical composition of horse sweat.** — J. Physiol. 147, 74–77. [Authors' summary.] 277

Mucoprotein has been found in horse sweat. Albumins are confirmed as the chief protein. Sweat caused by emotion contains higher concentrations of protein and electrolytes than does that after physical exertion.

purpose—treatment of dogs and research work. Essential qualities in donors are discussed and the technique for collection (which differs from that for human blood banks) is described. Collections may be made every 2 or 3 weeks, provided the donors are in a good state of nutrition.—T.E.G.R.



## REPRODUCTION AND REPRODUCTIVE DISORDERS

- Dziuk, P. J. (1959). **Artificial insemination in swine.**—*Stwest. Vet.* 12, 133-135. 279
- D. used a bovine type artificial vagina without pulsation for collecting from boars, and cow-type plastic disposable pipettes for insemination. 400 females were inseminated and slaughtered after 4-106 days. 60% conception rates were obtained after up to 24 hours' semen storage at 7°C., and 35% after up to 72 hours. Some of the literature is reviewed.—F. L. M. DAWSON.
- Blom, E. (1959). **A rare sperm abnormality: 'corkscrew-sperms' associated with sterility in bulls.**—*Nature, Lond.* 183, 1280-1281. 280
- After 15 years' study of infertile bulls, B. found this condition for the first time within a few months in 2 Red Danish bulls from A. I. centres. Most of the spermatozoa had corkscrew-shaped middle pieces visible under ordinary microscopy  $\times 1000$  with nigrosin/eosin staining. None of these spermatozoa was motile when viewed in wet preparations under phase-contrast. There was a steady increase in the proportion of corkscrew spermatozoa as the testicular degeneration progressed.  
—F. L. M. DAWSON.
- Berger, H.-J. (1959). **Befruchtungsergebnisse bei der Anwendung der Kohlensäurekonservierung des Spermas im Vergleich zum Zitratverdünner. [Fertility of bull semen preserved with carbon dioxide as compared with citrate diluent.]**—*Dtsch. tierärztl. Wschr.* 66, 437-439. [Summary in English.] 281
- In 3,863 artificial inseminations, semen stored for one day in the Illini variable temperature diluent was as fertile as that stored in citrate diluent, but the fall in fertility on the second day of storage was smaller in semen in the Illini variable temp. diluent.—M.G.G.
- VanDemark, N. L., Estergreen, V. L., Jr., Schoor, R. & Kuhlman, D. E. (1959). **Use of fluorescent dyes for observing bovine spermatozoa in opaque media.**—*J. Dairy Sci.* 42, 1314-1319. [Authors' summary modified.] 282
- A method for staining spermatozoa with fluorescent dyes and examination with ultraviolet light is presented. In semen diluted with opaque media the spermatozoa were clearly visible with no interference from fat globules or other extraneous material, and sperm motility was readily evaluated. Dyes in concentrations of 1 : 10,000 to 1 : 40,000 were not toxic to spermatozoa during 15 min. incubation at 37°C. and caused only a slight reduction in motility after storage at 5° for 24 hours.
- Vesselinovitch, S. D. (1959). **Microelectrophoresis of bovine spermatozoa.**—*Cornell Vet.* 49, 359-373. [Author's summary modified.] 283
- Bovine spermatozoa were studied in a microelectrophoretic cell.
- Immotile spermatozoa migrate only in the direction of the current; no two-directional migration was observed.
- Immotile and low-motile spermatozoa and those of low motility undergo galvanotaxis.
- Current of average intensity increases motility.
- The observations suggest that "electrophoretic" separation of the spermatozoa of normal fertilizing capacity may depend at least upon (a) electrophoresis, (b) galvanotaxis, and (c) increased motility of spermatozoa.
- Hall, J. G., Branton, C. & Stone, E. J. (1959). **Estrus, estrous cycles, ovulation time, time of service, and fertility of dairy cattle in Louisiana.**—*J. Dairy Sci.* 42, 1086-1094. [Authors' conclusions modified.] 284
- Oestrus of dairy cattle in tropics and subtropics is so short as to require observations more frequent than twice daily.
- Cows should apparently be served 7-12 hours after the onset of oestrus, but further work is needed on timing of service.
- There appears to be no practical reason for delaying service because of oestrous cycle irregularity if the cycle is at least 17 days in length and the cow is otherwise normal.
- Anoestrus is of considerable consequence, but management rather than physiological dysfunction appears to be the reason for most clinical anoestrus. The role of nutrition, the thyroid, and climate needs to be more definitely established.
- Täubrich, F. (1959). **pH-Werte der Vagina des gesunden Rindes und ihre Beziehungen zum Bakteriengehalt, Sexualzyklus und Alter der Tiere. [Vaginal pH values in healthy cattle in relation to bacterial content, oestrous cycle and age.]**—*Zuchthyg. FortpflStörung. u. Besamung* 3, 78-86. 285
- The pH of the cervical portion of the vagina was measured 179 times and the initial portion 117 times in 96 cattle. In the cervical

portion all except 5 of the measurements revealed a pH of between 7 and 8.2 and 61 (34%) a pH of between 7.7 and 7.9. In the initial portion of the vagina the pH was nearly always 0.2-0.4 higher than in the cervical region. A series of measurements in 5 cattle revealed variations of 0.6 to 1. Relation of pH and oestrous cycle was demonstrated only at heat, when pH fell by not more than 0.5. There were no differences between pregnant and non-pregnant animals. Age and bacterial content of the vagina appeared to have no influence on pH.—M.G.G.

Mansour, A. M. (1959). **The hormonal control of ovulation in the immature lamb.**—J. agric. Sci. 52, 87-94. 286

The earliest age at which ovulation could be induced by s/c inj. of 1,000 i.u. pregnant mares' serum was 16 weeks. Ovulation could be induced as early as 8 weeks by inoculation of pregnant mares' serum s/c and 500 i.u. chorionic gonadotrophin i/v 96 hours later.

—R.M.

Averill, R. L. W. & Rowson, L. E. A. (1959). **Attempts at storage of sheep ova at low temperatures.**—J. agric. Sci. 52, 392-395. [Authors' summary modified.] 287

Eighty-three fertilized sheep ova stored at 0.8°C. for 6-72 hours in sterile sheep serum or Ringer's soln. were transferred to recipient ewes to determine their viability. (1) Nine of twelve ova in sheep serum continued development after storage at 5° to 8°C. for 6-9 hours. Few survived storage in serum at 5° to 8° for 24, 48 or 72 hours. (2) Lambs were born to recipients of four out of six ova stored for 24 hours at 4.5° to 7° and of two out of five ova similarly stored for 72 hours. No ova survived storage for 24, 48 or 72 hours at 0.4°. (3) None of thirty-four ova developed after freezing to -79° in 12.5% glycerol in serum.

Austin, C. R. (1959). **Entry of spermatozoa into the Fallopian-tube mucosa.**—Nature, Lond. 183, 908-909. 288

The heads of spermatozoa were studied in the Fallopian tube mucosa of 6 bats, 2 rats, 1 rabbit, 1 hedgehog, 1 mole and 2 stoats. When the heads lay close to mucosal cell nuclei their surface appeared flattened or indented, evidence of a local reaction and that the penetration by the head of the spermatozoon did actually occur during life.

—F. L. M. DAWSON.

Tavener, H. W. & Green, W. W. (1959). **Diagnosis of bovine pregnancy by measuring vaginal response to oxytocin.**—J. Anim. Sci. 18, 865-873. [Authors' summary modified.] 289

A method for diagnosis of bovine pregnancy, especially in the early stages, was described. It is based on the indirect measurement of the contraction of vaginal muscles (by means of a balloon inflated in the vagina and connected to a manometer) in response to an i/v injection of 30 U.S.P. units of oxytocin. Increases over initial pressure of approx. 10 mm. Hg about 3-4 min. after injection are found when cows are pregnant. No or very little response was obtained from non-pregnant cows. If a response did occur, it was erratic. Cows in oestrus respond like pregnant cows, whereas cows in other phases of the oestrous cycle respond like non-pregnant cows. 321 cows were tested. A 90% accuracy of diagnosis of pregnancy was found even in the early stages of pregnancy.

Baumgärter, G. (1959). **Beobachtungen zur pränatalen Geschlechtsvorhersage beim Rind. [Prenatal sex determination in cattle.]**—Tierärztl. Umsch. 14, 263-264. 290

B. stated that the sex of unborn calves was related to the colour of the mucus issuing from the dam's vagina from the fifth month of gestation. Brownish mucus denoted a male calf, colourless mucus a female. The phenomenon was observed also in women.—M.G.G.

Lang, D. R. & Hansel, W. (1959). **A sexual dimorphism in three somatic tissues of cattle.**—J. Dairy Sci. 42, 1330-1337. [Authors' summary modified.] 291

A small, mildly chromotropic, plano-convex chromatin mass found predominantly in females was identified as sex chromatin. In liver, pancreas, and adrenal gland of females the sex chromatin appeared in 60-72% of cells examined, but in only 10% or less of the cells in males. The possible uses of sexual dimorphism in elucidating embryonal development, and for antenatal sex determination were considered. Unknown tissues were properly classified as to sex in 19 of 20 cases.

Erb, R. E. & Morrison, R. A. (1959). **Effects of twinning on reproductive efficiency in a Holstein-Friesian herd.**—J. Dairy Sci. 42, 512-519. 292

Over a 30 year period, 4.58% of the 7,387 calvings and abortions in a Holstein-Friesian herd were multiple births. Of the 182



like-sexed twins, an estimated 13·68% were monozygous. Of all births of known sex in the herd, 51·65% were males but amongst the twins 55% were males. The twinning rate was 1·3% for heifers and increased from 4·4% at the second calving to 7·1% at the tenth calving. By the time of birth, losses amongst twin calves were high and averaged 41% for males and 35% for females. There did not appear to be any difference in fertility between like-sexed female twins and singly born females. Although the average services per conception and calving intervals were not consistently different, the incidence of relative infertility was significantly higher after twinning primarily because a proportionately greater number of cows had post-parturient disorders as compared with those bearing single calves. Because of the greater incidence of infertility, fewer female progeny and the marked increase in liability to retained placenta and post-parturient disorders, twinning in dairy cattle is undesirable.—A. ACKROYD.

Leech, F. B. & Sellers, K. C. (1959). **A second survey of losses associated with pregnancy and parturition in Yorkshire sheep.**—*J. agric. Sci.* **52**, 117-124. 293

The authors repeated in greater detail a survey reported in 1955 [*V.B.* **26**, 1439]. It was based on questionnaires returned from 207 farms in Yorkshire and 32 in Lancashire. Causes of death during pregnancy, differential rate of abortion in single and multiple pregnancies, and dead foetuses as a cause of maternal death were discussed.—R.M.

Day, B. N., Anderson, L. L., Emmerson, M. A., Hazel, L. N. & Melampy, R. M. (1959). **Effect of estrogen and progesterone on early embryonic mortality in ovariectomized gilts.**—*J. Anim. Sci.* **18**, 607-613. 294

Early foetal death rate was determined by comparing number of corpora lutea with number of embryos as 33% on the 25th day of pregnancy and 38% by the 40th. 34 gilts were spayed on the 15th day after mating, and injected with various doses of progesterone and oestradiol benzoate for 10 days and then slaughtered. Progesterone, but not oestradiol, had some effect alone; the best combination was 100 mg. progesterone and 50 mg. oestradiol per 100 lb. body weight daily: mean foetal death rate was then only 22%.

—F. L. M. DAWSON.

Hanfstingl, J. (1959). **Zum Problem der Totgeburten.** [*The problem of stillbirth in*

pigs.]—*Tierärztl. Umsch.* **14**, 110-112. 295

In Bavaria 8% of piglets are stillborn, representing nearly half the total losses in piglets. Death apparently takes place immediately before or during birth; the piglets are not expelled quickly enough and suffocate. Causes of prolonged labour are old age, large litters, fatigue, infectious diseases, lack of exercise, malnutrition, hereditary disposition, and overweight.—M.G.G.

Schulz, L. C. & Grunert, E. (1959). **Physiologie und Pathologie der puerperalen Involution des Rinderuterus. Ein Beitrag zur Bedeutung der physiologischen Günstzeit in der Sterilitätsbekämpfung.** [*Physiology and pathology of puerperal involution of the bovine uterus.*]—*Dtsch. tierärztl. Wschr.* **66**, 29-37. [Summary in English.] 296

Uterine involution was studied in sections of post-mortem and biopsy material from 89 cattle, including some cases of retained placenta. Involution appeared to be complete morphologically by the end of six weeks, but it is stressed that functionally the uterus is not ready for a fresh conception before a second 6-week period has passed. In the histological study the measurements of stroma cells were the main criterion, as studied with the electron microscope. These showed important variations with phase as the oestrous cycle resumed, yet continued to alter consistently in shape and density up to the 12th week, though the more conspicuous fluctuations were over after the sixth. Thus at the 3rd-4th week density was double that at 10 days and 50% greater than in the resting uterus.—F. L. M. DAWSON.

Dow, C. (1959). **The cystic hyperplasia-pyometra complex in the bitch.**—*J. comp. Path.* **69**, 237-250. [Author's conclusions modified.] 297

An account of a survey of 100 cases: on a histological basis they were divided into four types.

Type I (23 cases)—cystic hyperplasia without cellular infiltration of the endometrial stroma. This was observed in animals in different stages of the cycle. Type II (17 cases)—a diffuse plasma cell infiltration superimposed on cystic glandular hyperplasia of the endometrium. This was found only in animals between 40 and 70 days post-oestrus. Type III (49 cases)—a polymorphonuclear infiltration of varying intensity superimposed on a cystic endometrium. The majority of these cases were in the first 40 days after oestrus. Type

IV (11 cases)—a chronic endometritis, often with squamous metaplasia of the epithelium. These were in the period 55 to 90 days after oestrus.

Corpora lutea were observed in the ovaries of 96 cases and it is concluded that this is of pathogenetic significance.

Mucci, G. (1959). L'associazione gonadotropina-stilbestrolo nel trattamento della sterilità funzionale nella specie bovina. [**Gonadotrophin-stilboestrol therapy in functional sterility in the cow.**] — Gazz. Vet., Milano No. 1 pp. 1-9. 298

As it was found in treating 34 suboestrous and anoestrous cows that 3,000 i.u. of serum gonadotrophin was the minimum effective dose, 1,000 i.u. intramuscularly in combination with 7 mg. stilboestrol dipropionate was tested for a possible synergic effect in 26 cases of suboestrus and 2 of persistent corpus luteum. Results were thought satisfactory in 24, though subsequent pregnancy was not confirmed in all cases. In some of these repeated treatment proved necessary. But of 12 showing complete ovarian quiescence only four responded. Where pregnancy was confirmed it often followed to service within 4 days of treatment, i.e., the heat produced was not merely a symptomatic one due to the stilboestrol.

—F. L. M. DAWSON.

Dawson, F. L. M. (1959). **The significance of cystic enlargement in the bovine corpus luteum.**—Brit. vet. J. 115, 46-54. 299

Cystic corpora lutea were found in 27 of 286 cows discarded as barren and examined before and after slaughter. Clinical examination revealed cysts in 17 cases and in 14 they were ruptured by hand without apparent harmful effect: in many cases rupture seemed to be followed within 2 or 3 days by restoration of a normal corpus luteum. The remaining cysts, not diagnosed clinically, were very small and appeared to form during normal maturation of the corpus luteum.—R.M.

Luktuke, S. N., Nayudu, P. R. V. & Bhattacharya, P. (1959). **Preliminary investigations on intra-uterine treatment with antibiotics in repeat-breeders.**—Indian J. vet. Sci. 28, 93-99. 300

36 cows and 4 heifers which returned to insemination were given intra-uterine treatment with an aqueous solution containing 4,000,000 i.u. of penicillin and 1 g. of streptomycin, 24 hours after insemination. Of the

treated cows, 20 conceived after a single treatment and 10 after two treatments.

Out of the four heifers, three conceived after a single treatment.

Moberg, R. (1959). Överblick över sterilitetsformerna i Riihimäki distrikt under produktionsåret 1955-1956. [**Sterility in Finnish dairy cows 1955-1956.**]—Proc. VIIIth Nord. vet. Congr., Helsinki, 1958. pp. 620-623. Discussion: 624. [In Swedish. English summary modified.] 301

Bovine sterility after dry summers is discussed from the following points of view: mineral deficiency (low solubility of minerals during dry years); vitamin A deficiency; production stress; insemination at the wrong time; excessive feeding of concentrates.

Hunter, G. L. (1959). **A contribution to the study of the problem of low fertility among Merino ewes in South Africa.**—J. agric. Sci. 52, 282-295. 302

Over a year the uterus and ovaries of 4,094 adult Merino ewes were examined. Active corpora lutea were found most frequently in autumn and early winter, except in animals from the more arid karoo areas, where the percentage of ewes ovulating and the mean ovulation rate was fairly constant throughout the year. Low fertility may be partly due to introducing rams into flocks in spring and summer when many ewes are anoestrous. Furthermore, most farmers select ewes for wool quality and body conformation rather than fertility. Other likely factors are loss of ova, and silent heat due to poor nutrition.—M.G.G.

Downs, W. G., Jr., Benson, B., Kinsolving, R., Hamilton, R. & Thompson, J. M. (1959). **Achondroplastic dwarfs in cattle.**—J. Tenn. Acad. Sci. 34, 52-57. 303

The anatomical and histological findings in 15 dwarf calves are described, and compared with those reported in the literature.—M.G.G.

Dollahon, J. C., Owens, K. G., Koger, M., Hentges, J. F., Jr. & Warnick, A. C. (1959). **Cerebrospinal fluid pressures of snorter dwarf-carrier and noncarrier cattle.**—J. Amer. vet. med. Ass. 135, 109-111. [Authors' summary modified.] 304

A method is described for determining the c.s.f. pressure of cattle by punctures between the atlas and axis vertebrae and in the lumbar region.

The c.s.f. pressure at the atlas-axis joint



was significantly lower in dwarf-carrier cattle than in non-carrier cattle. However the test could not be used for differentiation because of an area of overlap between the dwarf-carrier and non-carrier groups.

Julian, L. M., Tyler, W. S. & Gregory, P. W. (1959). **The current status of bovine dwarfism.** — J. Amer. vet. med. Ass. 135, 104-109. [Authors' summary modified.] 305

Dwarfing in cattle is a complex; at least four subgroups of dwarf types can be recognized.

The progeny test is the only technique available for dealing with the problem. But this is of little value unless all the types of dwarfs are recognized and unless all progeny resulting from test matings are carefully examined.

Current research at the University of California is briefly reviewed. Some of the results of anatomical investigations can be applied to improve the results obtained from progeny testing.

Stromberg, M. W. & Kitchell, R. L. (1959). **Studies on myoclonia congenita. IV. The segmental reflex in normal and affected pigs.** — Amer. J. vet. Res. 20, 627-633. [Authors' summary modified.] 306

The segmental reflex response was studied in 23 pigs (clinically affected, recovered from tremor, and normal controls). The response of pigs with tremor differed markedly from normal. The response of recovered pigs did not differ notably from normal, except possibly in the maximum amplitude ratios of first to second wave. The nature of the response in pigs with tremor suggested increased excitability by two-neurone-arc pathways and decreased excitability by multineuronal pathways.

I. Snively, J. G. (1959). **The genetic aspects of hip dysplasia in dogs.** — J. Amer. vet. med. Ass. 135, 201-207. 307

II. Henricson, B. & Olsson, S.-E. (1959).

**Hereditary acetabular dysplasia in German shepherd dogs.** — Ibid. 207-210. [Authors' summaries modified.] 308

I. Evidence is presented that dysplasia of the hips of dogs is significantly increased by deliberate breeding from dysplastic parents. It is assumed that this increase is genetically conditioned.

The number of animals was too small to elucidate the mechanism of transmission of the defect.

II. Acetabular dysplasia in Alsatian dogs is defined as a condition in which the acetabulum in a ventrodorsal symmetrical projection is reproduced on a radiograph as less than a half-circle. In 176 dogs with acetabular dysplasia the disease was bilateral in 78.4%. In a random sample of 191 dogs, a defect frequency of 26.7% was found. Of 85 Alsatian dogs with lameness of the hindlegs, acetabular dysplasia was the cause of lameness in 14. There is statistically significant evidence of the hereditary nature of the disease. The complex hereditary pattern is the subject of further studies. An interesting sex linkage is noticed. The aetiology of the disease is discussed, and of the different names in use, "hereditary acetabular dysplasia" seems to be most suitable.

Clarkson, T. B., Prichard, R. W., Netsky, M. G. & Lofland, H. B. (1959). **Atherosclerosis in pigeons. Its spontaneous occurrence and resemblance to human atherosclerosis.** — Arch. Path. 68, 143-147. [Authors' summary modified.] 309

Pigeons of the Autosexing King, Silver King, and White Carneau breeds have spontaneous atherosclerosis closely resembling the human disease, grossly and microscopically. Pigeons of different breeds, the Show Racer and Racing Homer, have almost no atherosclerosis. The evidence suggests that atherosclerosis in the pigeon is not related to sex, diet, or exercise but rather to a genetic factor and age.

See also absts. 46 (porcine leptospiral abortion); 50 51 (bovine genital vibriosis); 57 (metritis in dogs and cats); 117 (infectious pustular vulvovaginitis); 124 (sheep abortion virus); 169 (tick-borne fever causing ovine abortion); 197 (oestrogens in British pasture plants); 206 (effect of vitamin A deficiency on the testicles in rams); 219 (non-bacterial abortion in cattle with foetal liver lesions); 260 (effect of high environmental temperature on pregnancy in cows).

## ZOOTECCHNY

Bonadonna, T. & Camici, D. (1959). **Buffalo keeping in barns, and mechanical milking in the Salerno district.** — Emp. J. exp. Agric. 27, 252-261. [Authors' summary modified.] 310

The present and future status of the

buffalo as a commercial dairy animal in Italy is discussed. The methods successfully adopted for keeping milking buffaloes in barns along with ordinary dairy cows are described, and data for milk production of three herds in the

Salerno district are presented. In one of these herds the buffaloes are milked mechanically.

Romagosa Vila, J. A. (1959). Un ensayo de estabulación permanente en lanares. [**Trial of permanent housing of sheep.**]—Proc. XVIth Int. vet. Congr., Madrid 2, 967-970. [In Spanish.] 311

A flock of 200 sheep was kept permanently housed, except for 150 days per year when the animals were put out on stubble or pasture. When housed their daily ration per head was: 2,000 g. grape bagasse, 2,000 g. ensiled maize

stalks, 150 g. conc. protein mixture, 5 g. mineral mixture. During the experimental period (12-14 months) the lambing rate was 2 per ewe with 95% viability. Lamb mortality during the first 10-12 weeks was 2.5%. Throughout the experiment the animals maintained good health and were not troubled with parasitism. The animals were vaccinated against bluetongue and regularly treated with insecticides. The net profit per animal from meat and wool was 500 pesetas per year.

—T.E.G.R.

See also *absts.* 7 (milking machines and udder health); 318 (book, agriculture and animal husbandry in India); 319 (book, beef cattle husbandry); 320 (book, chinchilla breeding).

## TECHNIQUE AND APPARATUS

Kutsky, R. J. (1959). **Nucleoprotein constituents stimulating growth in tissue culture: active protein fraction.**—Science 129, 1486-1487. [Author's summary.] 312

A new method has been developed for removing the nucleic acid portion of the nucleoprotein fraction which stimulates growth in tissue culture. Biological activity resides in the purified protein fraction, while the high polymer nucleic acid fraction is inert. The active protein fraction contains extractable lipids which have no effect on the biological activity.

See also *absts.* 11 (differentiation of *B. cereus* from *B. anthracis*); 62 (medium for actinomyces species); 78 (medium for trichomonas); 147 (purification of viruses).

Lovelock, J. E. & Bishop, M. W. H. (1959). **Prevention of freezing damage to living cells by dimethyl sulphoxide.**—Nature, Lond. 183, 1394-1395. 313

Dimethyl sulphoxide, at a conc. of 15% by weight, completely protected human and bovine r.b.c. against damage by freezing. It also gave some protection to bull semen, but less than that afforded by glycerol.—M.G.G.

Li, V. V. (1959). [**Technique of forming gall bladder fistulas in poultry.**]—Sechenov J. Physiol. 45, 889-890. [In Russian.] 314

Surgical technique and construction of a suitable cannula are described.—R.M.

## BOOK REVIEWS

Martin, C. R. A. (1959). **Practical food inspection.** pp. vii+656. London: H. K. Lewis & Co. Ltd. 5th edit. 63s. 315

First published in 1932, the fifth edition now comprises a volume of some 650 pages. The general arrangement remains the same and the book is in two parts, one dealing with Meat and the other with Fish, Poultry and other Foods. Appendices on Bacteriological Classification and Collection of Morbid Specimens have been added, and new material includes a number of photographs which are better than many of the line drawings.

That this book has reached its fifth edition is evidence of its value, but there are some errors which should not have been made. More care might have been taken in the section dealing with parasites, and few in Great Britain would agree that "fluke infestation has at

different times been very prevalent in sheep but bovines are chiefly affected now". Mention might also have been made of human fascioliasis due to eating watercress growing in water contaminated by fluky sheep or cattle. The taxonomy of the parasites should be brought up to date, whilst spelling mistakes such as "*Ixodes recinis*", "*Cysticercus tennuicollis*" and "*Moneizia expansa*" still occur. Such errors should be corrected for they detract from a work which is of undoubted value.

Smith, H. R. (1958). **The conquest of bovine tuberculosis in the United States.** pp. 64 (unpaginated). Somerset, Michigan: The Author. \$1.00. 316

This booklet, though lacking in literary quality, is of outstanding merit. It describes the "moves behind the scenes" to convince the



ordinary man as well as stockowners of the need to eradicate bovine tuberculosis in the U.S.A. and of the feasibility of the project.

The professional man may understand the general requirements for the control of a disease, but he is often uninformed on fundamental requirements for a large-scale campaign.

Smith's booklet is therefore welcome and it indicates the need for further accounts of such work from many countries. It brings out another matter, the allocation of credit where it is due after a long campaign is over; those with the greatest claims may then have been forgotten.

The author, formerly Manager of the National Livestock Loss Prevention Board of Illinois, has described the campaign as he saw it develop. The meat packers of Chicago were important advocates for action during the second decade of this century. A Sanitary Committee of the Chicago Stock Exchange was set up in 1916 to press for action and the movement acquired momentum. In 1918 a milestone was a Conference at the Saddle and Sirloin Club, Chicago, when a resolution was passed to send a memorial to Congress, emphasizing the need to begin the task.

Brief paragraphs give notes of public meetings in many places to discuss progress. Money was raised to finance the appointment of staff and the allocation of funds from Federal sources is described.

Brief mention is made of the personalities concerned, including the great part played by John R. Mohler.—W.A.P.

Najjar, V. A. [Edited by.] (1959). **Immunity and virus infection. Symposium held at Vanderbilt University School of Medicine, May 1-2, 1958.** pp. viii+262. New York: John Wiley & Sons, Inc. London: Chapman & Hall Ltd. 84s. 317

This volume comprises the collected papers of a symposium held in 1958 and should be welcomed by workers in both immunology and virology for its expositions on some current theories and methods in both these disciplines.

Sir MacFarlane Burnet postulates the validity of the clonal selection theory of antibody formation in comparison with the direct template theory of Pauling. In contrast to this cellular concept, Haurowitz discusses the role of antigen in antibody formation from a molecular viewpoint.

A review of the properdin system by

Wedgwood is a welcome summary and Cann's contribution on the separation and purification of antibody is comprehensive. Other authors discuss some biological and clinical aspects of immunity.

The virology section covers plant, bacterial and animal viruses. Schaffer reviews the purification and physicochemical properties of plant and animal viruses and Luria considers viruses defined as infective genetic materials. Reduction of viral spread by artificial immunity demands a sufficiency of an immunized population, and the final chapters are devoted to poliovirus immunity.

—J. H. DARBYSHIRE.

Randhawa, M. S. (1958). **Agriculture and animal husbandry in India.** pp. xvi+364. New Delhi: Indian Council of Agricultural Research. Rs. 15.00. 318

This book is in three sections: The Land (96 pp.); Crops (188 pp.); Farm Animals, Poultry and Fish (50 pp.). There are also statistical tables (9 pp.); and a classified bibliography of 239 references.

The geology of the land and soils is described, together with the climate, systems of husbandry, and irrigation systems. Space devoted to farm animals is quite small. The cattle (155 million cattle and 48 million buffaloes, a little over a quarter of the cattle in the world) are described under headings for 26 breeds of cattle and seven of buffaloes. Characters of the breeds are neatly set out according to a scheme which allows of easy comparisons, under habitats, characteristic features and utility. Details about sheep, goats and poultry are brief.

This is a very useful reference book.

—W.A.P.

Fraser, A. (1959). **Beef cattle husbandry.** pp. xii+241. London: Crosby Lockwood & Son Ltd. 2nd revised edit. 21s. 319

The first edition was published in 1953 under the title "Farming for beef". Since then changes in marketing arrangements in the United Kingdom, including the Fat Stock Guarantee scheme of 1954, have necessitated revision of the text. A chapter headed "Recent scientific developments" discusses performance tests, hormone castration and dwarfism. There are 66 good photographs, mostly depicting beef breeds.—R.M.

Snow, C. F. (1959). **Chinchilla breeding.** pp. 85. London: W. & G. Foyle, Ltd. 3s. 320

This concise introduction to chinchilla

management will be welcomed by veterinary surgeons who have not yet become fully acquainted with this animal. Housing, feeding, breeding, and preparation of pelts are dealt with. In addition 11 pages are devoted to diseases: the information here is, of course, very sketchy but may provide some useful tips. The booklet ends with sections on selling, buying, costs and prospects. Here the author gives sound advice for prospective purchasers in the United Kingdom. "Breeding chinchillas will not make a fortune for anybody, neither is it a get-rich-quick proposition. As a part-time hobby, which will show a good profit over the years and will provide a good deal of pleasure, it is excellent". The booklet is one of the Foyles Handbooks series.—R.M.

Hornbostel, H. (1959). Bandwurmprobleme in neuer Sicht. [**New views on tapeworm problems.**] pp. 59. Stuttgart: Ferdinand Enke Verlag. DM 11. 321

H. discussed present knowledge of *Taenia saginata* with special reference to his own work on the fate of cysticerci during preparation of meat, mastication and digestion and on

experimental infection of human volunteers. A practical point emerging was that the diameter of pores in mincing machines must be not greater than 1.5 mm. diam. if all cysticerci in meat are to be killed. The smallest size at present used (3 mm.) let through about half the cysticerci undamaged.—R.M.

Ferrando, R. (1959). Les bases de l'alimentation. [**Principles of animal nutrition.**] pp. viii + 246. Paris: Vigot Frères. Fr. 2950. 322

The purpose of this book is to show the variety and interdependence of food requirements in domestic animals and birds. Chapters are devoted to water, carbohydrates, lipids, proteins, vitamins, minerals and trace elements; and the role of these substances in the body, their digestibility and absorption, and the effects of deficiency and excess are discussed. There are over 50 tables showing the nutrient content of various foods and the requirements of the different species. Finally, methods of measuring the calorific and nutritive value of foods are reviewed, and the problems of achieving a balanced and economical diet are discussed.—M.G.G.

#### BOOKS RECEIVED

[Notice of recently received books in this list does not preclude review]

Biester, H. E. & Schwarte, L. H. (Edited by) (1959). **Diseases of poultry.** pp. xiii + 1103. Ames, Iowa: Iowa State University Press. 4th Edit. \$14.50.

Frank, E. R. (1959). **Veterinary surgery.** pp. ii + 338. Minneapolis: Burgess Publishing Co. 6th Edit. \$6.50.

Krölling, O. & Grau, H. (1960). Lehrbuch der Histologie und vergleichenden mikroskopischen Anatomie der Haustiere. [**Text-**

**book of histology and comparative microscopic anatomy of domestic animals.**] pp. xi + 554. Berlin (& Hamburg): Paul Parey. 10th Edit. DM 136.

Smythe, R. H. (1959). **How animals talk.** pp. 109. London: Country Life Ltd. 18s.

— (1959). **British Postgraduate Medical Federation: lectures on the scientific basis of medicine.** Vol. VII 1957-58. pp. xi + 496. University of London, Athlone Press. 45s.



## CONTENTS

	<i>Page</i>
Diseases caused by Bacteria and Fungi ... ..	57
Diseases caused by Protozoan Parasites ... ..	65
Diseases caused by Viruses and Rickettsia ... ..	67
Immunity ... ..	76
Parasites in Relation to Disease [Arthropods] ... ..	79
Parasites in Relation to Disease [Helminths] ... ..	80
Spontaneous and Transmissible Neoplasms and Leucaemias [Including Fowl Paralysis] ... ..	86
Nutritional and Metabolic Disorders ... ..	86
Diseases, General ... ..	89
Poisons and Poisoning ... ..	91
Pharmacology and General Therapeutics ... ..	93
Physiology, Anatomy and Biochemistry ... ..	96
Public Health, Veterinary Services and Veterinary Education ... ..	99
Livestock Hygiene ... ..	99
Reproduction and Reproductive Disorders ... ..	99
Reports ... ..	102
Book Reviews ... ..	103
Books Received ... ..	106

# INDEX TO AUTHORS

- Abinanti, F. R., 439.  
 Abramishvili, E. S., 544.  
 Adamesteanu, C., 511.  
 Adamesteanu, I., 511.  
 Alexander, G. I., 566.  
 Ajello, L., 371.  
 Aldridge, C., 331.  
 Allen, P. H., 489, 490.  
 Allison, M. J., 377.  
 Anczykowski, F., 348, 357.  
 Appleby, E. C., 517.  
 D'Ascani, E., 425.  
 Ashcroft, M. T., 382, 384.  
 Auguadra, P., 521.
- Baker, N. F., 483, 489, 490.  
 Baldelli, B., 403.  
 Bamberger, K., 404.  
 Bankowski, R. A., 518.  
 Barker, R. M., 332.  
 Barnes, J. E., 328.  
 Bates, F. W., 526.  
 Bauman, P. M., 485.  
 Baxter, J. T., 477.  
 Becklund, W. W., 475.  
 Beeler, D. A., 522.  
 van Bekkum, J. G., 393.  
 Belschner, H. G., page 106.  
 Beuacerraf, B., 573.  
 Bendixen, H. J., 499.  
 Benson, D. A., 522.  
 Berg, B. N., 512.  
 Bergner, A. D., 542.  
 Beritashvili, K. P., 544.  
 Beritashvili, T. P., 543.  
 Bethell, F. H., 545.  
 Beverley, J. K. A., 392.  
 Bickoff, E. M., 588.  
 Biester, H. E., 602.  
 Billaudelle, H., 334.  
 Billingham, K. E., 450.  
 Bird, J., 420.  
 Birth, G. S., 579.  
 Bogart, R., 566.  
 Boguth, W., 568.  
 Bone, J. F., 601.  
 Booth, A. N., 588.  
 Boskis, B. O., 530.  
 Bouckaert, J. H., 548, 574.  
 Brent, L., 450.  
 Brockmann, F., 553.  
 Brotherton, J. G., 416.  
 Brown, M. L., 486.  
 Brownlee, A., 516.  
 Bryant, R. P., 375, 377.  
 Buckland, F. E., 448.  
 Burnet, F. M., page 106.  
 Burtin, P., 333.  
 Bushland, R. C., 454.  
 Butozan, V., 519.  
 Buttery, S. H., 561.
- Campbell, D. H., 445.  
 Campbell, R. S. F., 503.  
 Carithers, R. W., 486.  
 Carll, W. T., 528.  
 Carr, M. H., 567.  
 Casida, L. E., 594.  
 Casorso, D. R., 435.  
 Castañeda, M. R., 347.  
 Castle, M. E., 500.  
 Challen, S. B., 541.  
 Chang, M. C., 583.  
 Charié-Marsaings, C., 342.  
 Chernyak, V. Z., 514.  
 Chevriér, L., 399.  
 Chikatsune, M., 424.  
 Chiorboli, A., 520.  
 Christensen, J. F., 391.  
 Church, G., 503.  
 Cilli, V., 403.  
 Claus, K. D., 358.  
 Cockburn, W. C., 344.  
 Cohrs, P., 535.  
 Cole, H. H., 603.  
 Collins, D. H., 600.  
 Consden, R., 441.  
 Coombs, R. R. A., 447.  
 Cooper, B. S., 417.  
 Cornwell, R. L., 479.  
 Corsico, G., 368.  
 Corvazier, R., 364.  
 Cox, R. I., 589.  
 Croes-Buth, S., 592.  
 Crowley, L. V., 565.  
 Cupps, P. T., 603.
- Dacres, W. G., 338.  
 Dalgaard-Mikkelsen, S., 536.  
 Darrow, D. I., 461.  
 Davidson, J. C., 325.  
 Davis, R. E., 376.  
 Dawson, F. L. M., 576.  
 Dawson, F. W., 407.  
 Demidov, N. V., 462.  
 Destombes, P., 373.  
 Dick, M., 503.  
 Dickinson, L., 417.  
 Doetsch, R. N., 377.  
 Dolowy, W. C., 551.  
 Doroshko, I. N., 434.  
 Dorrington, J. E., 484.  
 Douglas, F. D., 537, 538.  
 Douglas, G. W., 431.  
 Douglas, J. R., 483, 489, 490.  
 Dow, C., 584.  
 Draper, H. H., 590.  
 Drudge, J. H., 456, 470.  
 Duke, H. L., 381, 383.  
 Dumas, N., 418.  
 Dunsford, I., page 106.  
 Dybing, O., 539.  
 Dzhalavyan, K. A., 367.
- Eddy, G. W., 461.  
 Elam, G. W., 456.  
 Ellemann, G., 345.  
 Emmens, C. W., 589.  
 Emro, J., 493.  
 Engel, M. B., 575.  
 Enright, J. B., 412.  
 Erichsen, S., 539.  
 Eto, M., 409.
- Fairbairn, J. W., 541.  
 Farr, M. M., 386.  
 Faulkner, D. E., 597.  
 Fay, L. D., 363.  
 Felton, F. G., 331.  
 Ferraro, A., 337.  
 Ferris, R. D., 411.  
 Finkel, M. P., 530.  
 Fishman, M., 442.  
 Flink, E. B., 569.  
 Flores Beltran, A., 347.  
 Flynn, R. J., 530.  
 Fontanelli, E., 425.  
 Fossatti, M. J., 372.  
 Fraser, C. M., 540.  
 Frederiks, H. H. J., 393.  
 Frenkel, H. S., 393.  
 Frenkel, S., 393.  
 Fritsch, R., 558.  
 Fritts, D. H., 476.
- Gallagher, C. H., 561.  
 Garbe, H. G., 396.  
 Garner, R. J., 501.  
 Garvey, J. S., 445.  
 Gawaz, E., 508.  
 Gebauer, H., 507.  
 Geiger, W., 395, 396.  
 Gelovani, D. M., 543.  
 Geroff, K. J., 550.  
 Gill, E., 432.  
 Girard, O., 364.  
 Giroud, A., 509.  
 Giroud, P., 418.  
 Di Giuseppe, F., 429.  
 Glascock, R. F., 591.  
 Glenchur, H., 358.  
 Golick, P. F., 601.  
 Golosov, I. M., 351.  
 Goor, Y. S., 598.  
 Grant, J., page 106.  
 Groth, A. H., Jr., 338.  
 Grubbe, J., 557.  
 Gryczowa, B., 357.  
 Gutierrez, J., 376.
- Habermalz, F., 568.  
 Hall, C. W., 579.  
 Hall, W. H., 353.  
 Hamann, K., 507.  
 Harding, H. P., 336.  
 Hardy, F. M., 406.  
 Hasenclever, H. F., 369.  
 Hasek, M., 449.  
 Hayashi, S., 424.  
 Hearn, H. J., 407.  
 Heggeness, F. W., 506.  
 Heinrich, H. C., 513.
- Heirman, A. L., 457.  
 Heisch, R. B., 380.  
 Hemmes, G. D., 465.  
 Van den Hende, C., 574.  
 Hendrickson, A. P., 588.  
 Hendrix, R. D., 362.  
 Herlich, H., 471.  
 Hill, H., 513.  
 Hirasawa, K., 424.  
 Hirota, E., 359.  
 Hoare, C. A., 379.  
 Hoekstra, W. G., 591.  
 Hoffman, R. K., 407.  
 Hopkins, T. L., 461.  
 Hopper, P. K., 428.  
 Horowitz, R. E., 565.  
 Hort, J., 449.  
 Hoshino, T., 595.  
 Hoskins, H. P., 601.  
 Hraha, T., 449.  
 Hubbard, E. D., 466.  
 Hulse, E. C., 352.  
 Hundemann, A. S., 432.  
 Hyde, J. L., 324.
- Ichihara, T., 409.  
 Iland, C. N., 332.  
 Inui, S., 359.  
 Isaacs, A., 401.  
 Isayama, Y., 340.  
 Ishin, H. S., 526.  
 Ishii, F., 323.  
 Ishitani, R., 423, 426.  
 Itikawa, O., 323.  
 Ivy, A. C., 551.  
 Iwata, A., 359.
- Jacob, K., 495, 496.  
 Janisch, M., 389.  
 Jaroslow, B. N., 385.  
 Jarrett, W. F. H., 482.  
 Jensen, F. W., 438.  
 Jezierski, A., 390.  
 Jirkovsky, M., 330.  
 Johnston, K. G., 413.  
 Johnston, R. V., 421.  
 De Jongh, S. E., 592.  
 Joysey, V. C., 570.  
 Jungherr, E. L., 435.
- Kaerberle, M. L., 346.  
 Kafig, E., 582.  
 Kaji, T., 410.  
 Kalugin, V. I., 339.  
 Kaplan, W., 371, 439.  
 Karsten, F., 350.  
 Kates, K. C., 474.  
 Kato, K., 424.  
 Kawakami, Y., 410.  
 Keep, J. M., 370.  
 Keller, R., 436.  
 Kemenes, F., 361.  
 Kemp, A., 504.  
 Kerr, W. R., 444.  
 Kertay, N., 330.  
 Killick, E. M., 532.  
 Knipping, E. F., 460.  
 Kohn, J., 441.  
 Korst, D. R., 545.  
 Kotlán, A., 389.  
 Kourilsky, R., 333.  
 Kovalenko, Y. R., 422.  
 Koval'skil, V. V., 563.  
 Kowalczyk, T., 537.  
 Krollfeiffer, H., 498.  
 Krueger, H., 566.  
 Kuhn, U. S. G., 527, 528.  
 Kumagai, T., 424.  
 Kuz'min, N. A., 326.
- Lacroix, J. V., 601.  
 Lambelin, G., 390.  
 Landram, J. F., 491.  
 Lane, J. J., 527, 528.  
 Langille, W. M., 522.  
 Laskin, D. M., 575.  
 Lateur, L., 390.  
 Lawrie, T. D. V., 503.  
 Leatham, J. H., page 106.  
 Lehman, D., 575.  
 Leland, S. E., Jr., 456, 470.  
 Lemaitre, Y., 400.  
 Lennette, E. H., 438, 439.  
 Leonidze, L. A., 543.  
 Levenson, S. M., 565.
- Lienert, E., 463.  
 Lindahl, I. L., 376.  
 Lindsay, D. B., 562.  
 Linman, J. W., 545.  
 Livingston, A. L., 588.  
 Loken, M. K., 526.  
 Long, M. J., 545.  
 Lotze, J. C., 388.  
 Lovrekevich, L., 361.  
 Lyman, R. L., 588.
- McCay, C. M., 560.  
 McClure, T. J., 502.  
 McDonald, M. F., 585, 586, 593.  
 Mackay, J. M. K., 416.  
 Mackenzie, C. G., 510.  
 Mackenzie, J. B., 510.  
 McKercher, D. G., 415.  
 McMahon, J. P., 380.  
 Majdan, S., 419.  
 Malagashvili, A. S., 544.  
 Malaga Alba, A., 347.  
 Malm, O. J., 565.  
 Mamatlashvili, V. G., 544.  
 Manson-Bahr, P. E. C., 380.  
 Marchant, J. V., 532.  
 Markovits, P., 420.  
 Marquardt, W. C., 476.  
 Martin, L., 587, 589.  
 Martinet, M., 509.  
 Mason, M. M., 605.  
 Mathews, J., 466.  
 Matumoto, M., 410.  
 Mayer, K., 601.  
 Mayhew, R. L., 473, 488.  
 Mee, D., 358.  
 Menascè, I., 425.  
 Merkal, S., 471.  
 Meryman, H. T., 582.  
 Mihajlovic, S., 519.  
 Minamimoto, S., 323.  
 Mingle, C. K., 349.  
 Le Minor, L., 342.  
 Mitchell, G. E., Jr., 590.  
 Miura, S., 408.  
 Miyamae, T., 408.  
 Mizuno, N. S., 526.  
 Molnár, I., 327.  
 Moorhead, L. V., 578.  
 Morgan, P. J., 547.  
 Mount, L. E., 564.  
 Mraz, F. R., 529.  
 Muchmore, H. G., 331.  
 Mulcock, A. P., 374.  
 Munekata, K., 424.  
 Murase, N., 340.  
 Murat, P., 357.  
 Murata, M., 340.  
 Musaev, M. A., 360.
- Nagai, T., 424.  
 Nelson, J., 540.  
 Neumann, A. L., 590.  
 Newberne, J. W., 421.  
 Newhall, J. H., 358.  
 Newman, J. P., 363.  
 Nossal, G. J. V., 443.  
 Nugara, D., 464.
- Oginsky, E. L., 599.  
 Okaniwa, A., 423, 426.  
 Olechnowicz, A. F., 397.  
 Olsson, B., 446.  
 Osebold, J. W., 391.  
 Otto, G. F., 485.  
 Oyar, W., 548, 574.  
 Ozerskaya, V. N., 481.
- Paes, J. F. A., 592.  
 Park, G. E., 551.  
 Parlett, R. C., 335.  
 Pearson, J. K. L., 444.  
 Pemberton, P. L., 365.  
 Pérez-Giménez, M. E., 469.  
 Perman, V., 526.  
 Perreau, P., 342.  
 Peterson, E. H., 362.  
 Phillips, T. N., 346.  
 Piéchaud, M., 373.  
 Pier, A. C., 372.  
 Pirrie, R., 503.  
 Pistey, W. R., 555.  
 Pletwright, W., 411.  
 Pöpsel, G., 556.



## Author Index

- Polding, J. B., 427.  
 Polkhovskii, F. Y., 354.  
 Popova, K. A., 481.  
 Porterneld, J. S., 402.  
 Post, G., 554.  
 Prasad, A. S., 569.  
 Prat, J., 414.  
 Price, D. A., 566.  
 Pridham, T. J., 430.  
 Prinz, W., 513.  
 Pritulin, P. I., 326.  
 Prokof'eva, M. T., 434.  
 Prudentov, N. A., 354.  
 Puls, J. F., 578.
- Raeside, J. I., 585, 586, 593.  
 Rakotomanga, J. C., 400.  
 Ramsey, H. H., 331.  
 Rankin, J. E. F., 444.  
 Ranney, A. F., 329.  
 Rasmussen, F., 536.  
 Rawes, D. A., 478.  
 Raynaud, M., 364.  
 van Rees, A. L. A., 366.  
 Rehfeld, C. E., 531.  
 Reid, W. M., 464.  
 Reinders, J. S., 505.  
 Reinecke, R. K., 492.  
 Relyveld, E. H., 364.  
 Rementsova, M. M., 356.  
 Renoux, G., 355.  
 Restani, R., 429.  
 Robbins, W. E., 461.  
 Roberts, F., 447, 451.  
 Roberts, J. A. Fraser, 571.  
 Robinson, E. A., 412.  
 Robinson, V. B., 421.  
 Roche, M., 469.  
 Roe, R., 580.  
 Rokutanda, T., 409.  
 Rose, J. H., 472.  
 Rosen, M. N., 391.  
 Rosenberger, G., page 106.  
 Rothstein, N., 486.  
 Roy, J. H. B., page 106.
- Rubin, R., 480.  
 Rust, J. H., 527.
- Sadler, W. W., 412.  
 Saito, J. K., 415.  
 Sanders, E. F., 421.  
 Sansom, B. F., 501.  
 Sashara, J., 424, 426.  
 Sato, G., 408.  
 Sautter, J. H., 526.  
 Scarnell, J., 478.  
 Scheunemann, H., 496.  
 Schindler, H., 559.  
 Schlaaff, S., 523.  
 Schleier, H., 557.  
 Schloerb, P. R., 567.  
 Schmidt, H., page 106.  
 Schnappauf, H., 568.  
 Scholtzseck, E., 387.  
 Schreiter, M., 343.  
 Schultze, M. O., 526.  
 Schutte, J. A., 492.  
 Schwarze, L. H., 602.  
 Schwöbel, W., 394, 398, 405.  
 Scott, G. R., 427.  
 Scott, M. T., 453.  
 Seamer, J., 378.  
 Second, L., 373.  
 Seghetti, L., 476.  
 Self, H. L., 594.  
 Sella, A., 467.  
 Senger, C. M., 476.  
 Shalkop, W. T., 468.  
 Sharman, R. S., 455.  
 Shaver, R. J., 491.  
 Shellabarger, C. J., 577.  
 Shibata, T., 323.  
 Shimizu, T., 410.  
 Shorb, D. A., 468.  
 Sijbesma, W., 366.  
 Siller, W. G., 524.  
 Simkiss, K., 525.  
 Simon, J., 537, 538.  
 Simonsen, I. M., 536.
- Simpson, R. M., 427.  
 Smith, G. R., 341.  
 Smith, W., 416.  
 Smythe, K. H., 604.  
 Southcott, W. H., 580.  
 Spears, H. N., 325.  
 Spies, H. G., 594.  
 Stamp, J. T., 416.  
 Stampa, S., 494.  
 Stanley, W. M., page 106.  
 Stefan'ski, W., 419.  
 Stone, H. D., 432.  
 Straub, O., 415.  
 Sugimura, K., 410, 424.  
 Sullivan, J. F., 432.  
 Sund, J. M., 537, 538.  
 Sureau, P., 400, 440.  
 Suzuki, K., 340.  
 Swain, R. H. A., 433.  
 Szakmáry, G., 404.
- Tata, J. R., 577.  
 Taylor, A. R., 437.  
 Terent'ev, F. A., 339.  
 Thamm, H., 343.  
 Thorstappen, H., 552.  
 Thome, M., 342.  
 Thorbecke, G. J., 572, 573.  
 Tillmann, H., page 106.  
 Toryu, Y., 595.  
 Traub, E., 394, 398, 405.  
 Trautwein, G., 535.  
 Trawinski, A., 487.  
 Trum, B. F., 527, 528.  
 Turner, H. N., 580.  
 Turner, J. H., 474.  
 Turpin, A., 364.  
 Tyler, C., 525.
- Umbreit, W. W., 599.
- Vallée, A., 373.  
 Vasil'ev, K. M., 339.  
 Vernon, E., 344.
- Versényi, L., 389.  
 Verwer, M. A. J., 497.
- Wada, E. M., 415.  
 Waddell, A. W., 546.  
 Waletzky, E., 493.  
 Walker, R. F. R., 500.  
 Wallace, W. S., 493.  
 Watanabe, M., 359, 426.  
 Watanabe, S., 409.  
 Watson, W. C., 503.  
 Weatherell, J. A., 533, 534.  
 Weidmann, S. M., 533, 534.  
 Welsh, H. H., 438, 439.  
 Wertejuk, M., 419.  
 Westwood, M. A., 401.  
 Whitehead, G. L., 363.  
 Wichmann, R. W., 518.  
 Wilkins, J. R., 549.  
 Williams, C. M., 578.  
 Wills, C. G., 430.  
 Wilson, G. I., 474.  
 Winn, J. F., 439.  
 Wood, I. B., 493.  
 Worden, C. E., 362.  
 Wright, J. F., 555.  
 Wright, M. J., 537, 538.  
 Wunderly, C., page 106.  
 Wyant, Z. N., 456, 470.
- Yamada, S., 409.  
 York, O. J., 421.  
 Youatt, W. G., 363.  
 Youmans, G. P., 335.  
 Yunin, A. N., 452.
- Zabrodin, V. A., 351.  
 Zamurii, I. R., 339.  
 Zatzman, M. L., 436.  
 Zimmerman, D. R., 594.  
 Zimmermann, W. J., 466.  
 Zinneman, H. H., 353, 569.  
 Zlotnik, I., 416.  
 Zwart, D., 515.

## ERRATA

V.B. 30, abst. 67. For Clark read: Clarke.

abst. 70. In line 2 of title, for "a study" read: a further study.

abst. 169. For Overås, J. read: Øverås, J.

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